ORDER NO. MTNC020411C1
B2

Service Manual

HDTV MONITOR

Main Manual
(P7W)

Panasonic

Models	Chassis
PT-47WX52F	**EP824**
PT-47WX52CF	**EP824**
PT-47WX42F	**EP824**
PT-47WX42CF	**EP824**

This service manual is issued as a service guide for the models of the **P7W** family listed above. Included in this manual are a set of schematics, alignment procedures, disassembly procedures and a complete parts list.

“**WARNING!** This Service Manual is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. **Products powered by electricity should be serviced or repaired only by experienced professional technicians.** Any attempt to service or repair the product or products dealt with in this Service Manual by anyone else could result in serious injury or death.”

The service technician is required to read and follow the “**Safety Precautions**” and “**Important Safety Notice**” in the Main Manual.

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Important safety notice

Special components are used in this projection television which are important for safety. These components are identified on the schematic diagram by the symbol ⚠ and printed in **BOLD TYPE** on the replacement part list. It is essential that these critical parts are replaced with the manufacturer's specified replacement part to prevent x-ray radiation, shock, fire or other hazards. Do not modify the original design without the manufacturer's permission.

Safety precautions

General guidelines

An ***isolation transformer*** should always be used during the servicing of a PTV whose chassis is not isolated from AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect the PTV from being damaged by accidental shorting that may occur during servicing.

When servicing, observe the original lead dress, especially in the high voltage circuit. Replace all damaged parts (also parts that show signs of overheating.)

Always replace protective devices, such as fishpaper, isolation resistors and capacitors, and shields after servicing the PTV. Use only manufacturer's recommended rating for fuses, circuits breakers, etc.

High potentials, as high as 32.5kV, are present when this PTV is operating. Operation of the PTV without the rear cover introduces danger for electrical shock. Servicing should not be performed by anyone who is not thoroughly familiar with the necessary precautions when servicing high-voltage equipment.

Extreme care should be practiced when **handling the *picture tube***. Rough handling may cause it to implode due to atmospheric pressure. (14.7 lbs. per sq. in.). Do not nick or scratch the glass or subject it to any undue pressure. When handling, use safety goggles and heavy gloves for protection. **Discharge the picture tube** by shorting the anode to chassis ground (not to the cabinet or to other mounting hardware). When discharging connect cold ground (i.e. DAG ground lead) to the anode with a well insulated wire or use a grounding probe.

X-ray precautions

The front area (between the projection tube and the lens) is enclosed by a metal box to ensure positive safety during normal and abnormal conditions when checking and repairing. To fully ensure safety, the following precautions must be observed.

1. Do not remove the lens or metal box.
2. Make sure to turn the power OFF when the lens is removed or when checking the cleanliness of the lens.
3. Do not remove the lens or metal box to check the projection tube for operation by watching it directly. Use a mirror or paper to view the image.

Before returning a serviced PTV to the owner, the service technician must thoroughly test the unit to ensure that is completely safe to operate. **Do not use a line isolation transformer when testing.**

Leakage current cold check

Unplug the AC cord and connect a jumper between the two plug prongs. Press the POWER switch ON.

Measure the resistance between the jumpered AC plug and expose metallic parts such as screw heads, antenna terminals, control shafts, etc. If the exposed metallic part has a return path to the chassis, the reading should be between 240kΩ and 5.2MΩ. If the exposed metallic part does not have a return path to the chassis, the reading should be infinite.

Leakage current hot check (see figure 1)

Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during the check.

Connect a 1.5kΩ 10 watt resistor in parallel with a 0.15µF capacitor between and exposed metallic part and ground. Use earth ground, for example a water pipe.

Using a DVM with a 1000 ohms/volt sensitivity or higher, measure the AC potential across the resistor.

Repeat the procedure and measure the voltage present with all other expose metallic parts.

Verify any potential does not exceed 0.75 volt RMS. A leakage current tester (such a Simpson model 229, Sencore model PR57 or equivalent) may be used in the above procedure, in which case any current measure must not exceed 0.5 milliamp. If any measurement is out of the specified limits, there is a possibility of a shock hazard and the PTV must be repaired and rechecked before it is returned to the customer.

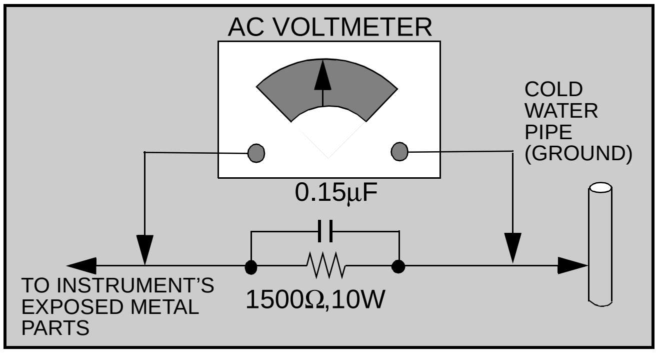


Figure 1. **Hot check circuit**

Insulation test

Connect an insulation tester between an exposed metallic part and AC line.

Apply 1080VAC/60Hz for 1 second. Confirm that the current measurement is 0.5mA ~ 2.0mA. Repeat test with other metallic exposed parts.

X-ray radiation ⚠

WARNING: The potential source of x-ray radiation in the PTV is in the high voltage section and the picture tube.

Note: *It is important to use calibrated equipment.*

Apply all black video signals (1080i) and confirm high voltage measures **31.5 ± 1.0kV.** If the high voltage is not within the range, change C514 to 1800pF, 2000pF, 2400pF or 2700pF until the desired value is obtained.

Apply NTSC white pattern and confirm the high voltage measures **30.1 ± 1.5kV**.

Apply HD 1080I white pattern and confirm the high voltage measures **30.1 ± 1.5kV**

About lead free solder (PbF)

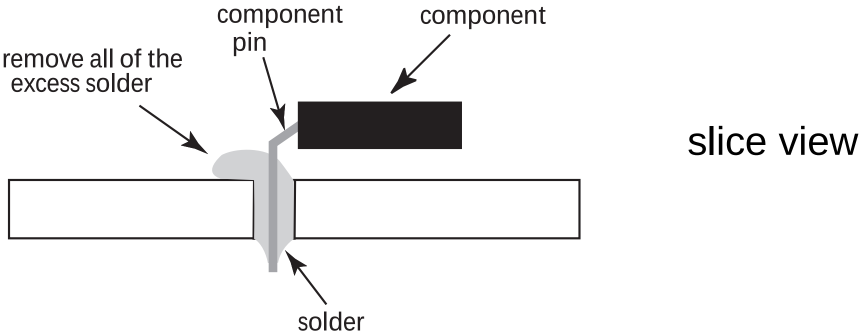
Note: Lead is listed as (Pb) in the periodic table of elements.
In the information below, Pb will refer to Lead solder, and PbF will refer to Lead Free Solder.
The Lead Free Solder used in our manufacturing process and discussed below is (Sn+Ag+Cu).
That is Tin (Sn), Silver (Ag) and (Cu) although other types are available.

This model uses Pb Free solder in it’s manufacture due to environmental conservation issues. For service and repair work, we’d suggest the use of Pb free solder as well, although Pb solder may be used.

PCBs manufactured using lead free solder will have the PbF within a leaf symbol PbF stamped on the back of PCB.

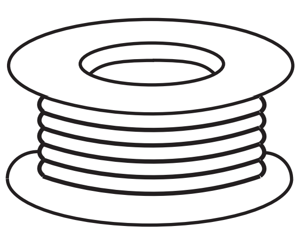
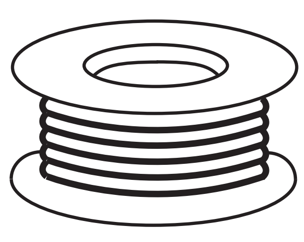
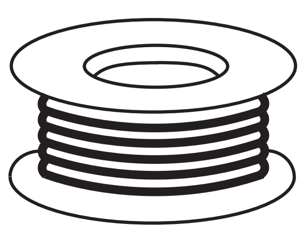
Caution

- Pb free solder has a higher melting point than standard solder. Typically the melting point is 50 ~ 70 °F (30 ~ 40 °C) higher. Please use a high temperature soldering iron and set it to 700 ± 20 °F (370 ± 10 °C).
- Pb free solder will tend to splash when heated too high (about 1100 °F or 600 °C). If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If this is not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.
- After applying PbF solder to double layered boards, please check the component side for excess solder which may flow onto the opposite side. (see figure below)



Suggested Pb free solder

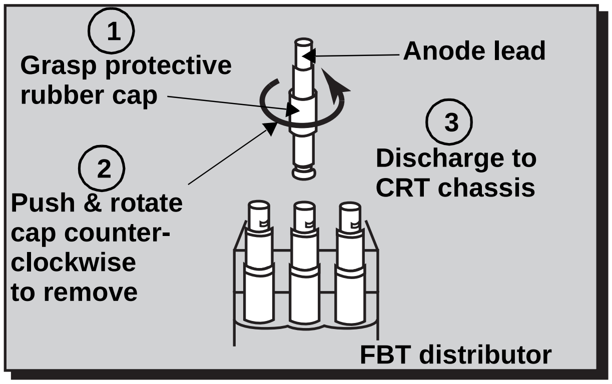
There are several kinds of Pb free solder available for purchase. This product uses Sn+Ag+Cu (tin, silver, copper) solder. However, Sn+Cu (tin, copper), Sn+Zn+Bi (tin, zinc, bismuth) solder can also be used.

0.3mm X 100g	0.6mm X 100g	1.0mm X 100g
		

Important safety tests

Measuring H.V. ⚠

The anode caps are cemented to the CRTs. To gain access for high voltage measurement, remove the red CRT's anode lead from the flyback transformer distributor. Grasp the anode lead protective cap at its bottom and squeeze it against the locking cap body inside, rotate 1/4 turn counter clockwise and pull the anode lead sleeve out of the FBT distributor. Connect a high voltage lead (+) from your H.V. meter to the FBT distributor, and the common (-) to cold ground (⏚). (see figure 2).



①
Grasp protective rubber cap
Anode lead
③
Discharge to CRT chassis
②
Push & rotate cap counter-clockwise to remove
FBT distributor

Figure 2. **Removal of FBT leads**

Note: *Reinsert the anode lead into the FBT distributor until it is tightly and fully seated. Turn the locking cap clockwise to lock in place.*

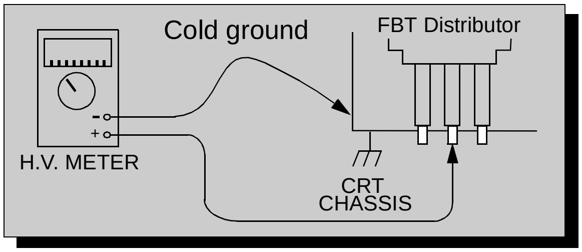
(EHT) Protector operation check

With the cabinet back removed, apply a nominal 120V AC to the PTV.

Over voltage test

Preparation:

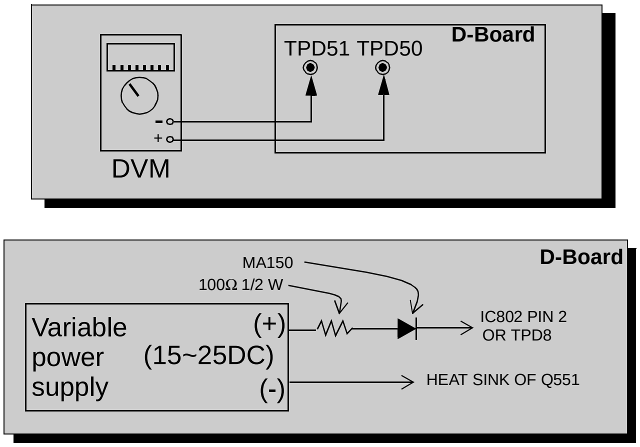
1. Turn PTV "OFF"
2. Connect a NTSC signal generator to the antenna terminal.
3. Connect DVM (+) TPD50 and (-) TPD51 on D Board (see figure 4)



Cold ground
FBT Distributor
-
+
H.V. METER
CRT
CHASSIS

Figure 3. **Measuring H.V.**

4. Connect a H.V. meter (static type, class 0.1) with high voltage leads to high voltage distributor on FBT. (See figure 4)



TPD51 TPD50
D-Board
-
+
DVM
MA150
100Ω 1/2 W
D-Board
Variable power supply
(+)
(15~25DC)
(-)
IC802 PIN 2
OR TPD8
HEAT SINK OF Q551

Figure 4. **DVM & power supply connection.**

5. Connect the 15 ~ 25 V DC variable power supply to (+) TPD8 or IC802 pin 2 (D-Board) and (-) heat sink of Q551 (see figure 4).

Procedures:

1. Apply a NTSC white pattern.
2. Turn PTV ON.
3. Adjust the picture or brightness controls so that the DVM reads 12.4 volts ± 0.4 volts.
4. Increase the variable power supply until set turns off. The set should turn off at 12.4 volts ± 0.4 volts (DVM) and high voltage less than 36.4kV.
5. If the DVM reading is other than 12.4 volts (± 0.4 volts), readjust picture or brightness control and repeat steps 3.
6. Turn off the variable supply and confirm that the set will turn on with the remote control.

About format aspect switching(WX 16:9 or HX 4:3)

Widescreen 16:9 and non-widescreen 4:3 PTVs use the same light box, for this reason is important to set it to the correct version (16:9 or 4:3). To change the format please refer to figure 62 on page 43.
Be sure to select the correct format for the serviced PTV.

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Service notes

Note: These components are affixed with glue. Be careful not to break or damage any foil under the component or at the pins of the ICs when removing. Usually applying heat to the component for a short time while twisting with tweezers will break the component loose.

Leadless chip component (surface mount)

Chip components must be replaced with identical chips due to critical foil track spacing. There are no holes in the board to mount standard transistors or diodes. Some chip capacitor or resistor board solder pads may have holes through the board, however the hole diameter limits standard resistor replacement to 1/8 watt. Standard capacitor may also be limited for the same reason. It is recommended that identical components be used.

Chip resistor have a three digit numerical resistance code - 1st and 2nd significant digits and a multiplier. Example: 162 = 1600 or 1.6kΩ resistor, 0 = 0Ω (jumper).

Chip capacitors generally do not have the value indicated on the capacitor. The color on the component indicates the general range of the capacitance.

Chip transistors are identified by a two letter code. The first letter indicated the type and the second letter, the grade of transistor.

Chip diodes have a two letter identification code as per the code chart and are a dual diode pack with either common anode or common cathode. Check the parts list for correct diode number.

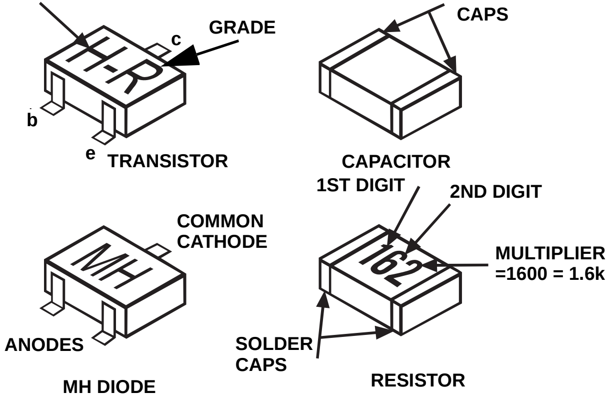
Component removal

1. Use solder wick to remove solder from component end caps or terminal.
2. Without pulling up, carefully twist the component with tweezers to break the adhesive.
3. Do not reuse removed leadless or chip components since they are subject to stress fracture during removal.

Chip component installation

1. Put a small amount of solder on the board soldering pads.
2. Hold the chip component against the soldering pads with tweezers or with a miniature alligator clip and apply heat to the pad area with a 30 watts iron until solder flows. Do not apply heat for more than 3 seconds.

Chip components

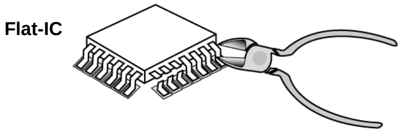


How to replace Flat-IC

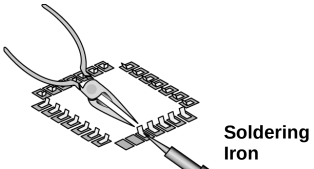
- Required tools -

- Soldering iron
- Sharp pliers (wire cutters and long nose)
- De-solder braids
- Magnifier

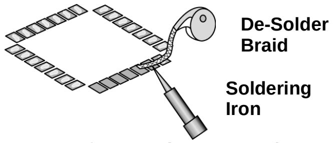
1. Cut the pins of the defective IC with the wire cutter pliers, and remove it completely away from the board. If the IC is glued to the board, apply hot air to complete the removal. **CAUTION**- Do not pull or twist the pliers, it may damage the soldering pads in the board .



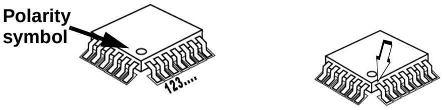
2. Using the soldering Iron and the long nose pliers, remove the IC pins that are still attached to the board.



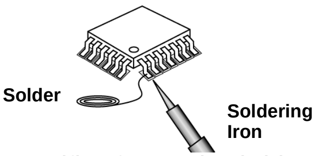
3. Using the de-solder braid and the soldering Iron, remove the solder from the board soldering pads.



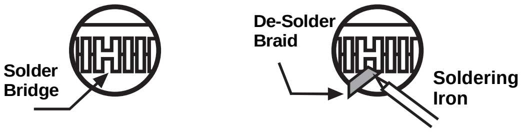
4. Position the new flat IC in place (apply the pins of the flat IC to the soldering pads where the pins need to be soldered). Properly determine the positions of the soldering pads and pins by correctly aligning the polarity symbol. Start aligning and soldering Pin No.1, then align and solder the pin in the apposite corner of the IC, this will help to align the rest of the pins.



5. Solder all pins to the soldering pads using a fine tipped soldering iron.



6. Check with a magnifier for solder bridge between the pins or for dry joint between pins and soldering pads. To remove a solder bridge, use a de-solder braid as shown in the figure below.



Service notes (continued)

IMPORTANT: To protect against possible damage to the solid state devices due to arcing or static discharge, make certain that all ground wires and CRT DAG wire are securely connected.

CAUTION: The power supply circuit is above earth ground and the chassis cannot be polarized. Use an isolation transformer when servicing the PTV to avoid damage to the test equipment or to the chassis. Connect the test equipment to the proper ground ((▽) or (⏚)) when servicing, or incorrect voltages will be measured.

WARNING: This PTV has been designed to meet or exceed applicable safety and x-ray radiation protection as specified by government agencies and independent testing laboratories.

To maintain original product safety design standards relative to X-ray radiation and shock and fire hazard, parts indicated with the symbol ⚠ on the schematic must be replaced with identical parts. Order parts from the manufacturer’s parts center using the parts numbers listed in this service manual, or provide the chassis number and the part reference number.

For optimum performance and readability, all other parts should be replaced with components of identical specification.

Feature table

FEATURE	PT-47WX52F PT-47WX52CF	PT-47WX42F PT-47WX42CF
Chassis	P7W	
Number of channels	181	
Menu language	Eng/Span/Fr	
Closed caption (CC)	X	
V-Chip (USA/CANADA)	X	
Picture in Picture (PIP)	2T split	
VIDEO INPUT MEMORY/SKIP	SKIP	
2RF	X	
Remote control number	EUR7603Z30	EUR7603Z40
Screen protector	W/PROT SCRN	W/O PROT SCRN
Comb filter	ADV 3D Y/C (NEW)	
Color temp	X	
NEW YNR	X	
VM	X (DIGITAL)	
V/A norm	X	
DIGITAL SCAN RATE	1080i, 480p	
NTSC LINE-DOUBLER	480p SMOOTH PROGRESSIVE	
MTS/SAP/DBX	X	
Bass/Bl/Treb control	X	
AI sound	X	
SURROUND	X	
Spatializer/BBE	BBE	
Built-in audio power	15WX2 (10%)	10WX2 (10%)
Number of speakers	4	2
A/V in (rear/front)	4 (3/1)	
S-VHS in (rear/front)	2/1	
Audio out	Fixed & Variable	
COMPONENT INPUT (Y, Pb, Pr)	2	
Dimensions mm WxDxH in	1111x1236x626 43.74x48.66x24.64	
Weight (kg/lbs)	82/180.78	
Power source (V/Hz)	120V 60Hz	
Anode voltage	31.5kV ± 1.0kV	
Video input jack	1Vp-p 75Ω, phono jack	
Audio input jack	500mV RMS 47kΩ	

Table 1: **Feature Table**

Specifications are subject to change without notice or obligation. Dimensions and weights are approximate.

Boards designation

BOARD	PART NUMBER	BOARD DESCRIPTION
A-Board	TNP2AH035	signal processing
D-Board	TNPH0371	power and deflection
LB-Board	TNP2AA110	blue driver
LG-Board	TNP2AA111	green driver
LR-Board	TNP2AA112	red driver
G-Board	TNP2AA090	front A/V panel
K-Board	TNP2AA089	front button panel
R-Board	TNPA0615AB	IR receiver

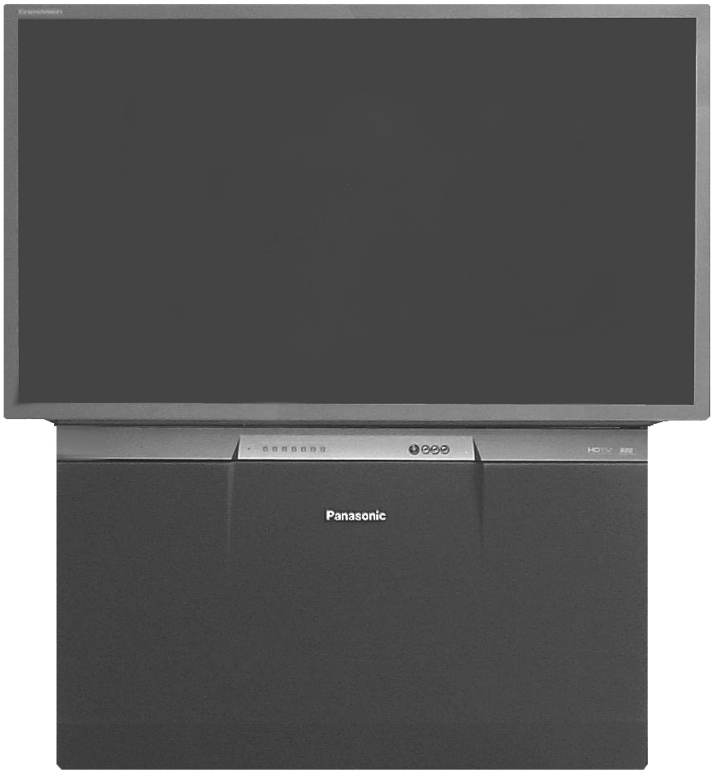
Table 2: **Boards designation**

Note: ***The A-Board (*****TNP2AH035*****) is non-serviceable****.* *Except for A-Board both tuners, IC2302, IC7001, IC7002, IC871, IC872, IC873. If any of these components or board is defective repleace it with a new one and take back the defective board to the service center.*

Notice: *When ordering any board, add and " S" after the board suffix application.*

Example: *If Order D-Board, should be ordered as:* TNPH0371*S.*

PTV - Location of controls



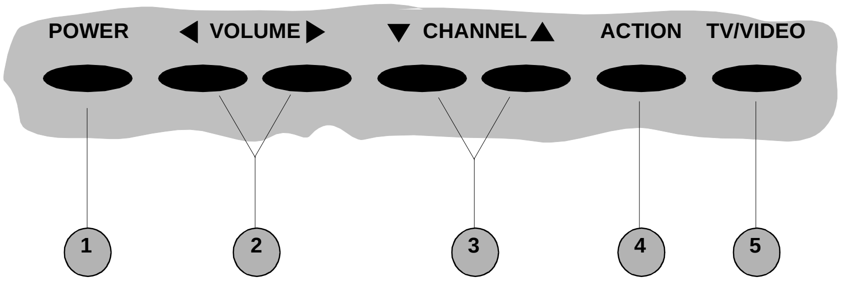


Figure 5. **Location of controls PTV**

Quick reference control operation

Quick reference control operation	
①	**Power -** Press to turn ON or OFF.
②	**Volume -** Press to adjust sound level, or to adjust audio menus, video menus, and select operating features when menus are displayed
③	**Channel -** Press to select programmed channels. Press to highlight desired features when menus are displayed. Also use to select cable converter box channels after programming remote control infra-red codes (the TV/AUX/CABLE switch must be set in CABLE position).
④	**Action -** Press to display main menu and access on screen feature and adjustment menus.
⑤	**TV/Video -** Press to select TV or one of the video inputs, for the main picture or the PIP frame (when PIP frame is displayed).

Remote - location of controls

POWER Button	Press to turn ON and OFF.
MUTE Button	Press to mute sound. A second press resumes sound. Press also to access and delete Closed Caption display.
TV, VCR, DVD, CBS/CBL	Component function buttons
VOL (volume) Buttons	Press to adjust TV sound level. Use with Channel buttons to navigate in menus.
R-TUNE (Rapid Tune) Button.	Press to switch to the previous channel.
ACTION Button	Press to display main menu and access or exit on screen features and adjustment menus.
REW, PLAY, FF, TV/VCR, STOP, PAUSE, REC & VCR CHANNEL Buttons	Component function buttons.
DBS EXIT& DBS GUIDE Buttons	DBS function buttons.
LIGHT Button	Press to light remote control buttons.
SAP	Access second audio program
ASPECT	Select picture size (ratio) to match programming format
MOVE, PIP, SPLIT/SIZE, FREEZE, SWAP, SEARCH, PIP CHANNEL	PIP function buttons

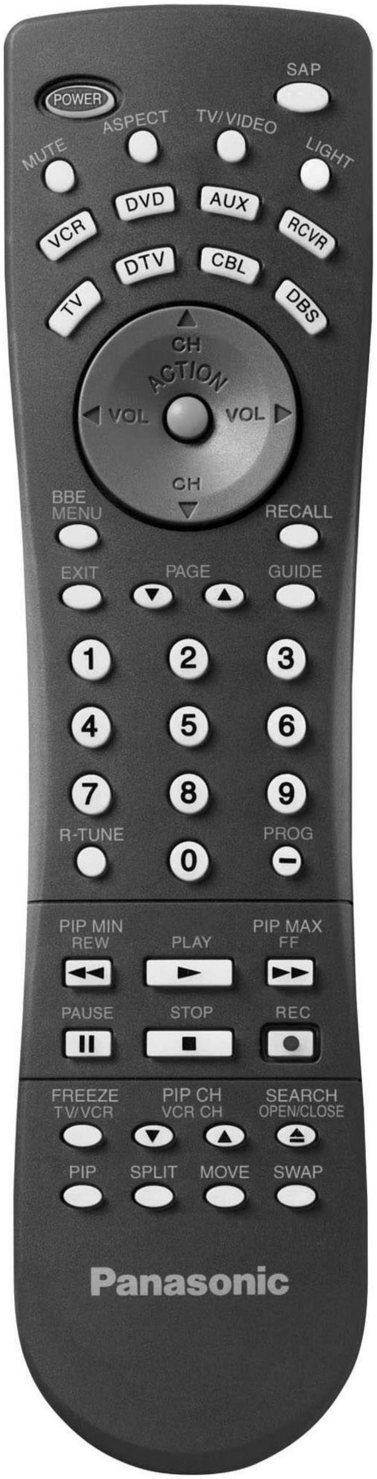

SAP
POWER
ASPECT
TV/VIDEO
MUTE
LIGHT
DVD
AUX
VCR
RCVR
DTV
CBL
TV
DBS
CH
ACTION
VOL
VOL
CH
BBE MENU
RECALL
EXIT
PAGE
GUIDE
1
2
3
4
5
6
7
8
9
R-TUNE
0
PROG
PIP MIN REW
PLAY
PIP MAX FF
PAUSE
STOP
REC
FREEZE TV/VCR
PIP CH VCR CH
SEARCH OPEN/CLOSE
PIP
SPLIT
MOVE
SWAP
Panasonic

Figure 6. **Location of controls (EUR7603Z30 remote)**

For additional information for this remote please refer to the owner's manual section remote operation, listed on the parts list.

Remote - location of controls

POWER button	Press to turn ON and OFF.
MUTE button	Press to mute sound. A second press resumes sound. Press also to access and delete Closed Caption display.
TV, VCR, DVD, CBS/CBL	Component function buttons
VOL (volume) buttons	Press to adjust TV sound level. Use with channel buttons to navigate in menus.
R-TUNE (rapid tune) button.	Press to switch to the previous channel.
ACTION button	Press to display Main Menu and access or exit On Screen features and Adjustment Menus.
REW, PLAY, FF, TV/VCR, STOP, PAUSE, REC & VCR CHANNEL buttons	Component function buttons.
DBS EXIT& DBS GUIDE buttons	DBS function buttons.
LIGHT button	Press to light remote control buttons.
SAP	Access second audio program
ASPECT	Select picture size (ratio) to match programming format
MOVE, PIP, SPLIT/SIZE, FREEZE, SWAP, SEARCH, PIP CHANNEL	PIP function buttons

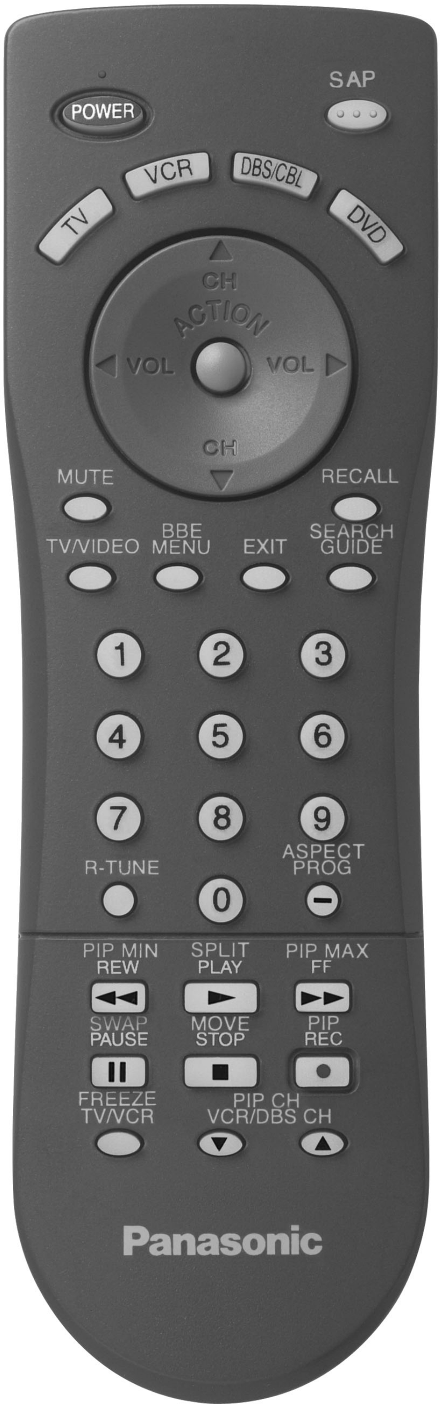

SAP
POWER
VCR
DBS/CBL
TV
DVD
CH
ACTION
VOL
VOL
CH
MUTE
RECALL
TV/VIDEO
BBE MENU
EXIT
SEARCH GUIDE
1
2
3
4
5
6
7
8
9
R-TUNE
ASPECT PROG
0
PIP MIN REW
SPLIT PLAY
PIP MAX FF
SWAP PAUSE
MOVE STOP
PIP REC
FREEZE TV/VCR
PIP CH VCR/DBS CH
Panasonic

Figure 7. L**ocation of controls (EUR7613Z40 remote)**

For additional information for this remote please refer to the owner's manual section remote operation, listed on the parts list.

Auto diagnosis feature

This receiver incorporates a new auto-diagnosis feature. With this new feature will be easier for the technicial to detect the failures. There is a LED located by the keyboard on the front panel, this LED will start flashing when a failure is detected by the circuits located in specific areas, depending on how many times the LED is flashing, this will tell you what circuit should be checked.
Make a count of flashing and see Table 3.
Please use this feature effectively especially for intermittent problems.

NUMBER OF FLASHES	POSSIBLE CIRCUIT
1	+140
2	LOW DC
3	CONVEREGENCE
4	HHS
5	IC4011
6	IC4018

Table 3: **SOS of front LED**

After the count:

Proceed to check that area, verify what board is the problem located, this way the area to check will be reduced until the failure is found.

A-Board check points

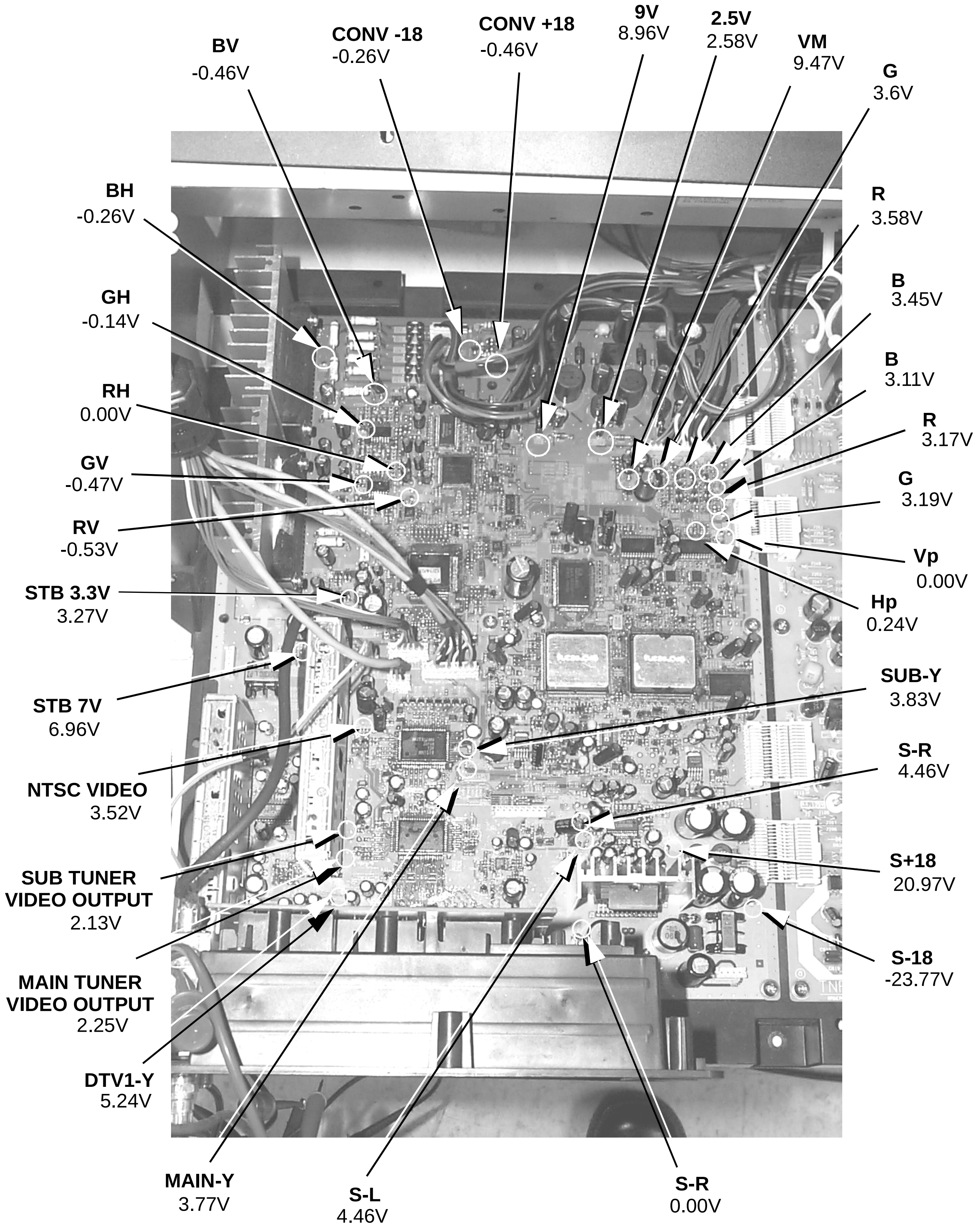
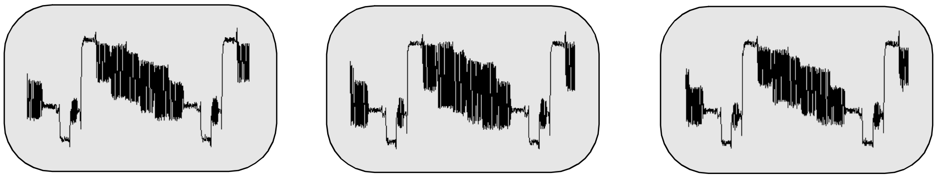

BV
-0.46V
CONV -18
-0.26V
CONV +18
-0.46V
9V
8.96V
2.5V
2.58V
VM
9.47V
G
3.6V
BH
-0.26V
R
3.58V
GH
-0.14V
B
3.45V
B
3.11V
RH
0.00V
R
3.17V
GV
-0.47V
G
3.19V
RV
-0.53V
Vp
0.00V
STB 3.3V
3.27V
Hp
0.24V
SUB-Y
3.83V
STB 7V
6.96V
S-R
4.46V
NTSC VIDEO
3.52V
S+18
20.97V
SUB TUNER VIDEO OUTPUT
2.13V
S-18
-23.77V
MAIN TUNER VIDEO OUTPUT
2.25V
DTV1-Y
5.24V
MAIN-Y
3.77V
S-L
4.46V
S-R
0.00V

Figure 8. **A-Board check points**

Note: *All the measurments are in DC with a digital multimeter, color bar pattern, picture settings normalized and sound set to minimum.*

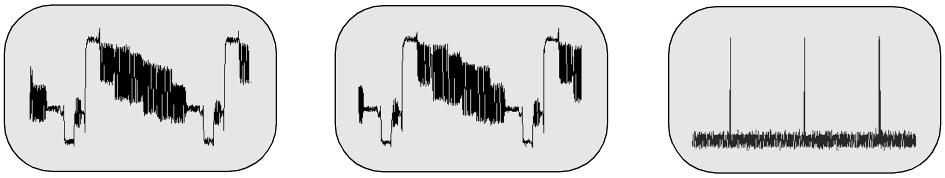
A-Board check points waveforms



Main tuner video output
15.72 kHz, 1 Vpp,
10µs sec/div

Sub tuner video output
15.72kHz, 1.00Vpp,
10µs sec/div

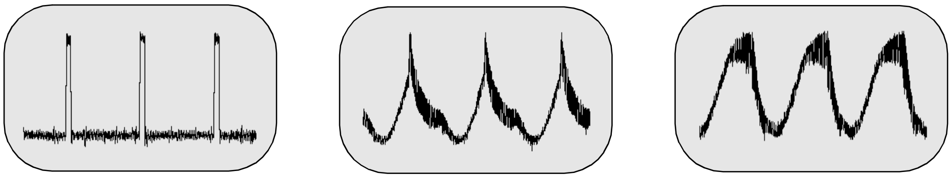
Main Y
15.72kHz, 1.00Vpp
10µs sec/div



Sub Y
15.72kHz, 1.92Vpp,
10µs sec/div

NTSC video
15.72kHz, 2.02Vpp,
10µs sec/div

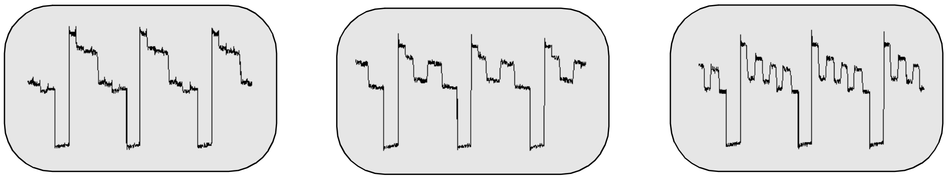
VP
60Hz, 3.36Vpp,
5µs sec/div



HP
31.65kHz, 3.32Vpp,
10µs sec/div

Conv -18
60.24Hz, 0.75Vpp,
5µs sec/div

Conv +18
60.24Hz, 0.24Vpp,
5µs sec/div



G
31.65kHz, 4.72Vpp,
10µs sec/div

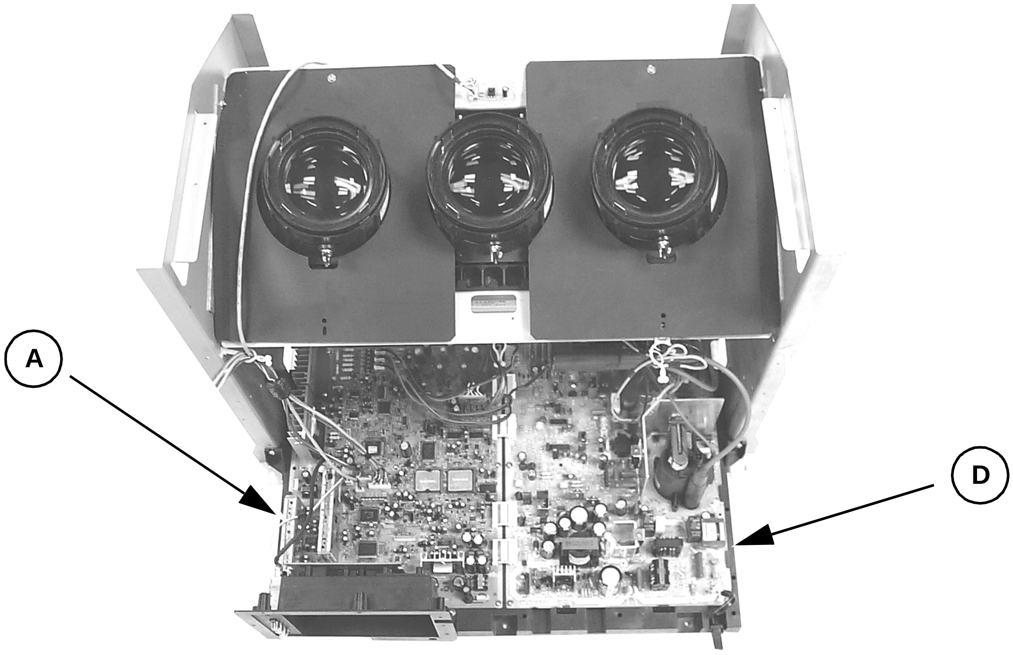
R
31.65kHz, 4.44Vpp,
10µs sec/div

B
31.65kHz, 4.40Vpp,
10µs sec/div

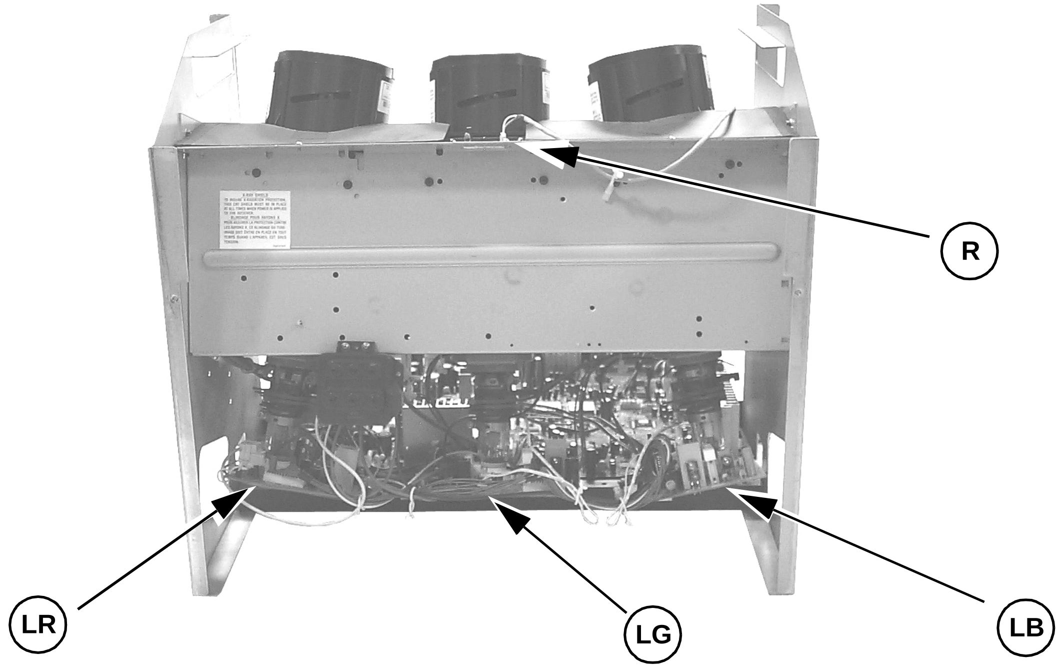
Figure 9. A-Board check points waveforms.

Note: *Waveforms were obtained with colorbar pattern, picture settings normalized and sound set to minimum.*

Chassis & boards layout



Top view



Back view

Figure 10. Chassis & boards layout.

Board description

A	Main chassis, video processing, convergence, audio processing
D	Power supply, vertical out, horizontal out
LB	Blue CRT output
LG	Green CRT output
LR	Red CRT output
R	IR sensor

Disassembly for service

Note: Board ground wires may have to be disconnected to disassemble some boards. All ground wires must be reconnected using jumper leads, if necessary, before power is applied to PTV for service.

Speaker grille removal (figure 11)

The speaker grille is secured to the cabinet of the PTV. grip panel from the sides and middle upper part, gently pull forward to remove. When reassembling, make certain to firmly press on the panel where the insertion points (5) are located, one at each corner and one at the middle top edge.

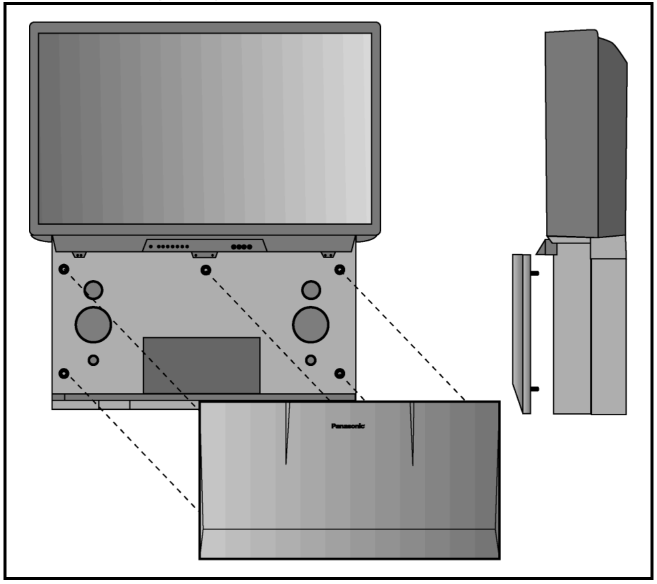


Figure 11. Speaker grille removal.

Keyboard removal

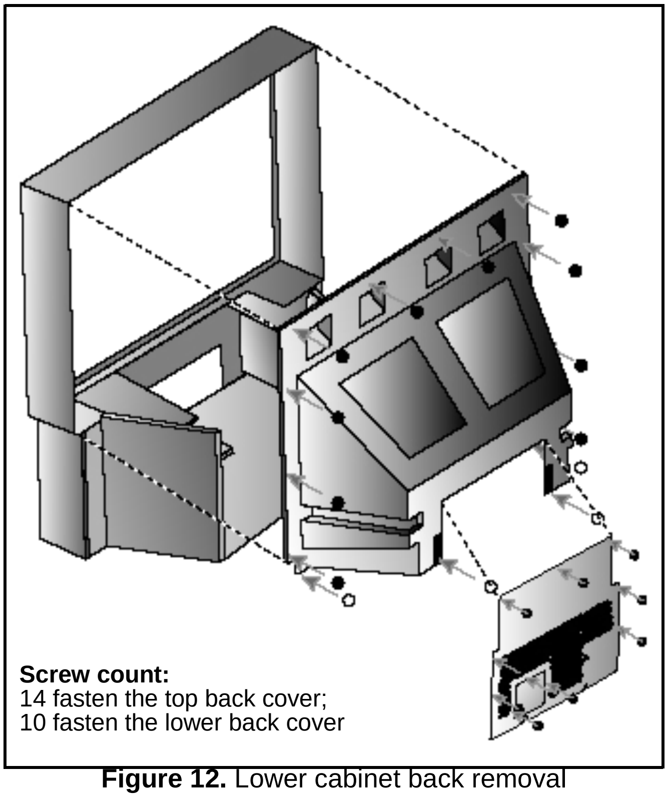
1. Remove the speaker grille. See figure 11.
2. Unplug the connectors from the Keyboard and front A/V inputs assemblies. Remove the screws affixing the keyboard to the frame assembly. Tilt the keyboard assembly upward and release it from the screen frame assembly.

Speakers replacement

1. Remove the speaker grille. See figure 11.
2. Each speaker is secured to the cabinet with (4) screws.
3. Disconnect the R & L speaker lead connectors from the speaker units.

Cabinet back lower cover removal (figure 12)

1. Remove (7) hex screws around the perimeter, marked with arrows. See figure 12 for screws location.
2. Remove (3) screws from around the A/V terminal board (marked with arrows).



Screw count:
14 fasten the top back cover;
10 fasten the lower back cover

Figure 12. Lower cabinet back removal

Cabinet back cover removal (figure 12)

1. Remove the cabinet back lower cover. (Detailed previously).
2. The top back cover (plastic shell) is secured with (14) screws around its perimeter. See figure 12 for screws location.
3. Be careful not to damage the mirror secured to the underside of the back cover.

Mirror removal (figure 13)

The mirror is attached inside the cabinet cover. Carefully remove the cabinet cover to access its interior surface and remove the screws securing the brackets that hold the mirror at the top and sides to the mirror. See figure 13.

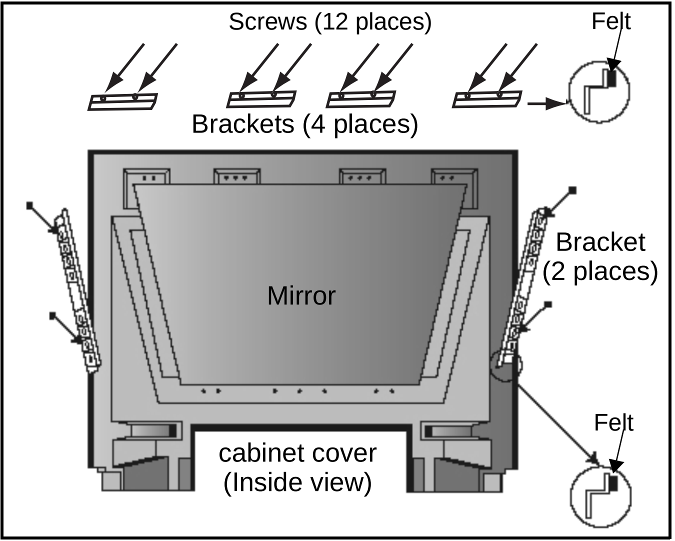


Figure 13. Mirror removal

Disassembly for service (continued)

Screen frame removal

1. Remove the speaker grille. Disconnect the cables leading to the keyboard and the AV panels and remove the keyboard and AV panel assembly. The assembly is secured by three (3) screws.
2. At this point the front cover is held only by four screws, be careful not to push the cabinet forward.
3. Remove screws and tilt the assembly forward while lifting it out of place.

Screen assembly (figure 14)

1. Remove the screen frame. See screen frame removal procedure above.
2. Place screen frame face down on a soft surface.
3. Remove all screen brackets and corner brackets

Note: *The brackets are painted black (permanent marker) on the edge to prevent reflection on image.*

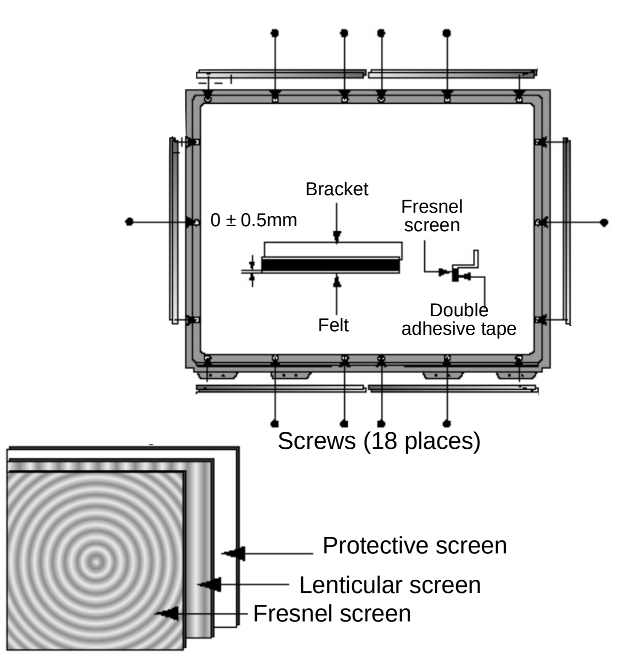


Figure 14. Screen assembly

4. Note exact orientation and order of each screen. The orientation and order of the screens is critical for displaying pictures properly. Detailed screen assembly can be seen in figure 14.

Main chassis block (figure 15)

1. Remove the speaker grille. See figure 11.
2. Remove the cabinet back lower cover. See figure 12.
3. The main chassis block is secured to the cabinet by screws at front, behind the Speaker Grill and inside on the bottom of the optical frame).
4. Remove the horizontal barrier panel at the back of the cabinet.
5. Unplug connectors (K1, G1 and speaker connectors) and pull out the main chassis block.

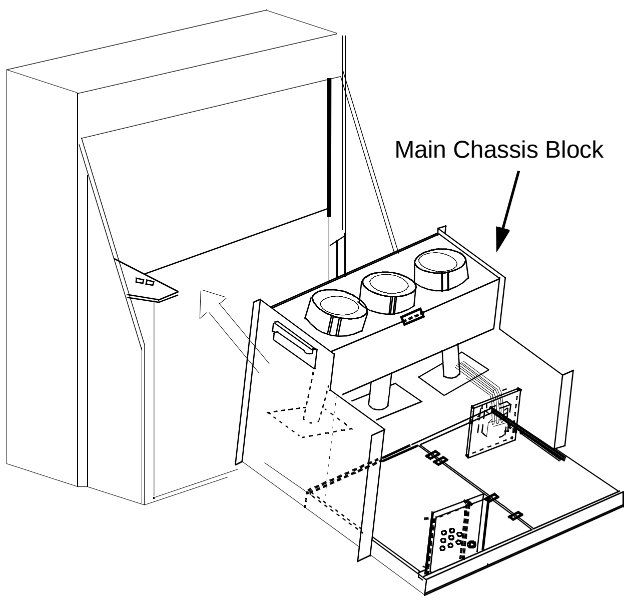


Figure 15. Chassis removal

Note: *Main chassis block can be serviced either in normal position or laying on its back (protect hookup terminal from damage).*

Chassis assembly

The chassis assembly shown in figure 18 includes all the electrical and optical (light box) components.

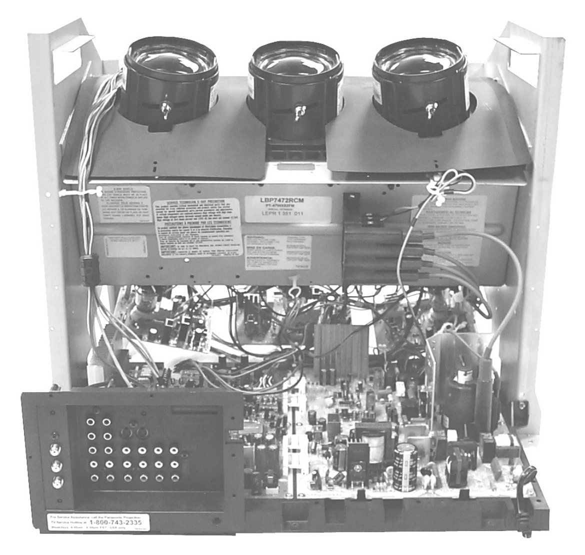


Figure 16. Chassis rear view

Disassembly for service (continued)

Disassembly for CRT replacement

To facilitate CRT replacement, the complete CRT mounting chassis does not need to be removed.

1. Remove the main chassis block from the cabinet. See figure 15.
2. Remove the optical bracket metal cover (rear side) by removing (6) screws from back, (2) screws from top, and (2) screws from each side. See figure 17 & figure 18.

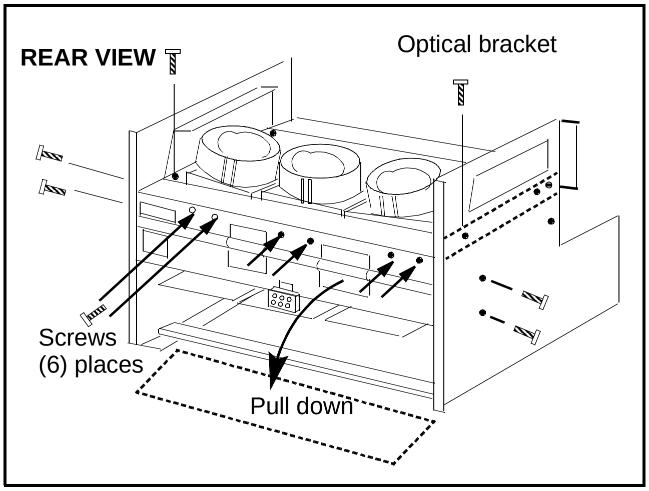


Figure 17. CRT replacement

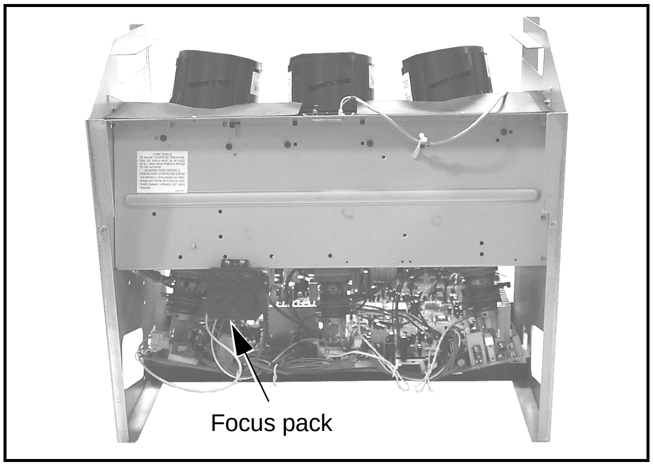


Figure 18. Light box front view

3. Remove the defective CRT anode lead from the high voltage distributor block that is mounted on the flyback transformer. Discharge to CRT chassis.
4. Unplug connectors from the B-Board. See board layout. B9 for red, B10 for green, or B11 for blue.
5. Unplug the defective CRT black DAG ground connector from the CRT Board.
6. Remove the CRT Board from the defective CRT neck.
7. Remove (2) screws from the defective CRT housing. See figure 19.**

CAUTION: Do not remove the (4) CRT lens screws.

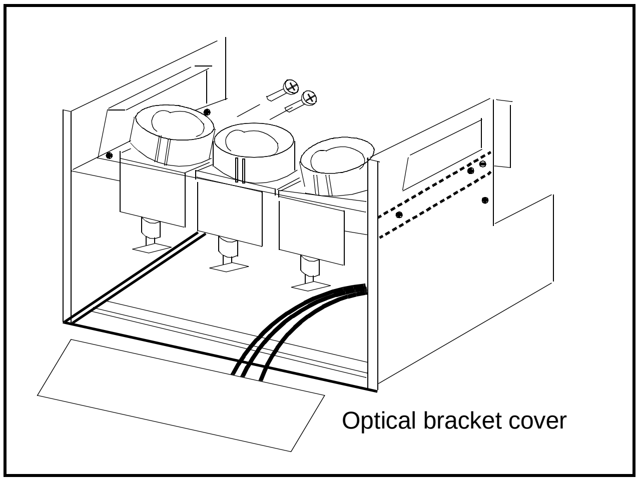


Figure 19. CRT replacement.

**** CAUTION:** Support the CRT assembly when loosening screws.

---

8. Release CRT anode lead from CRT chassis wire clamp and all other wires from holders.
9. Loosen a screw that secures the DY and remove it from the CRT neck.

Caution: *To insure x-ray radiation protection, the lens must be mounted in place at all times when power is applied to the PTV.*

CRT replacement

1. Remove CRT focus lens assembly (4 screws).

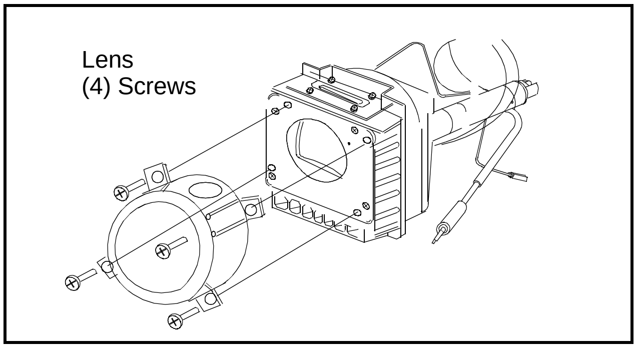


Figure 20. CRT assembly.

2. Lay CRT face down on a soft cloth.
3. Note position of yoke with centering tabs and remove from defective CRT.
4. Remove CRT DAG ground from defective CRT. Mount it on the replacement CRT exactly as it was on the defective CRT.

Note: *Replacement CRT is supplied with H.V. anode lead attached.*

5. Wire the anode lead wire.

6. Wire the anode lead wire.

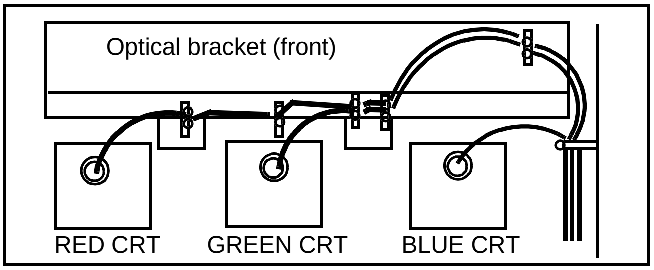

Optical bracket (front)
RED CRT
GREEN CRT
BLUE CRT

Figure 21. **Wire guide**.

7. Install yoke with other CRT neck assemblies on CRT neck in the same order and position as removed from the defective CRT.
8. Press yoke against bell of CRT and tighten the clamp just snug enough so it will not easily shift.
9. Assemble CRT focus lens assembly to new CRT with (4) screws. Make sure focus lens adjustment nut is in the same location as on other CRT focus lens.

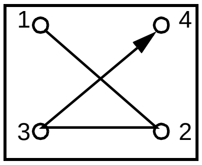


Figure 22. **CRT screw tightening order**.

Note: *Please assemble with screws in the order shown and tighten with the same torque.*

Optical block position adjustment

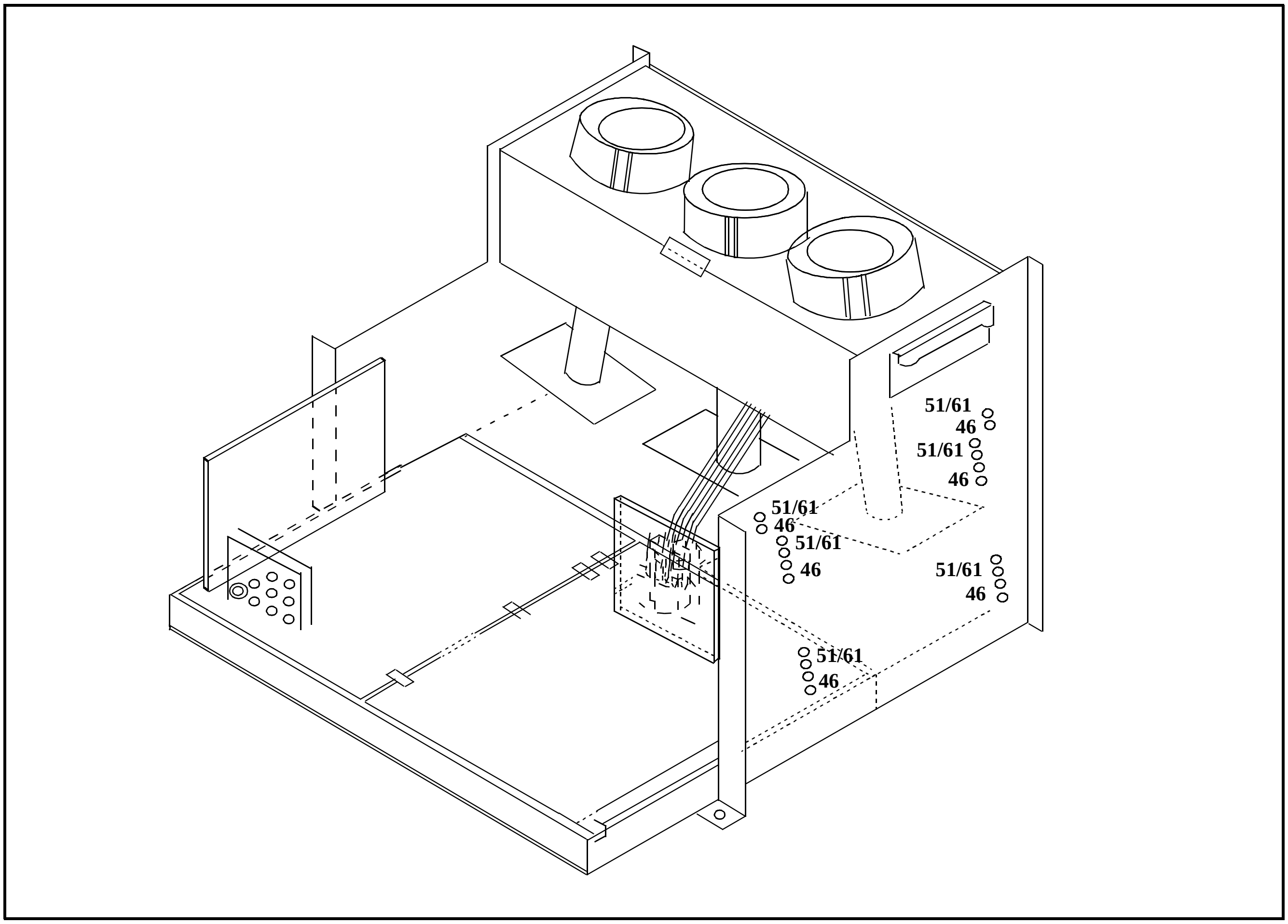

51/61
46
51/61
46
51/61
46
51/61
46
51/61
46
51/61
46

Figure 23. **Optical block position**.

The optical block mounting has holes to allow for the different size projection screens. These mounts will adjust to projection screens.

If the optical block is removed for service or is replaced, it is important that the correct mounting holes are used.

PTV screen assemblies

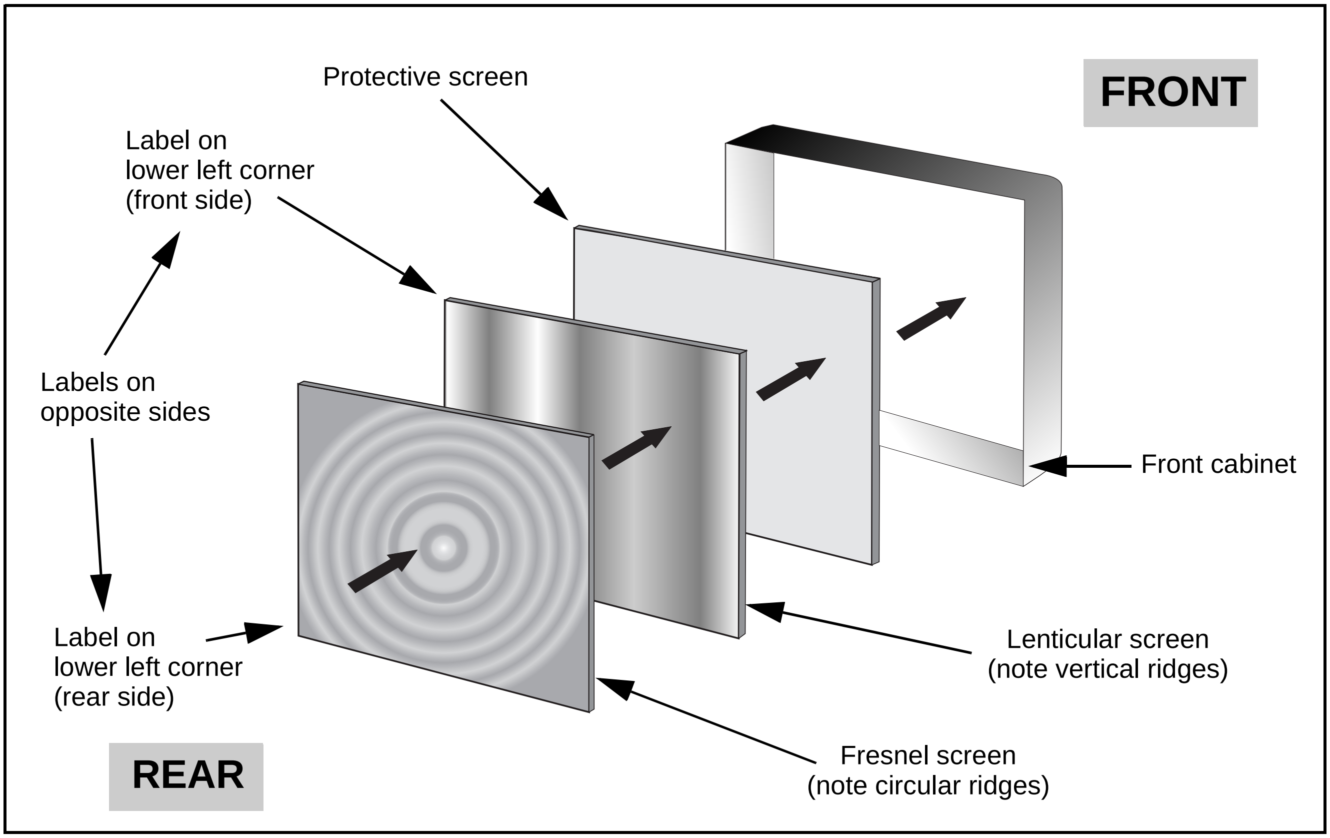

Protective screen
FRONT
Label on lower left corner (front side)
Labels on opposite sides
Front cabinet
Label on lower left corner (rear side)
Lenticular screen (note vertical ridges)
REAR
Fresnel screen (note circular ridges)

Figure 24. **Screen assemblies.**

B+ voltages table

Preparation:

Set the following controls

- **Picture.......................... Normal**.
- **Bright .... Normal**.
- **Volume .... Min. (0).**

Procedure:

1. Apply a white NTSC pattern.
2. Connect the (-) lead of the digital voltmeter to TPGND1 (cold ground).
3. Connect the (+) lead of the digital voltmeter to each test point and confirm the B+ voltages (see Table 4).

No.	Test point (D-Board)	Voltage
1	TPD14	138.6±1.0
2	TPD13	19.0±1.5
3	TPD12	19.0±1.5
4	TPD11	-19.0±1.5
5	TPD10	22.0±1.5
6	C845 (-)	-22.5±1.5
No.	**Test point (A-Board)**	**Voltage**
1	TPA031	9.0±0.5
2	TPA030	5.0±0.5

Table 4: **B+ voltages table**

CRT set up

CAUTION: Insure yoke plugs on the A-Board are reconnected before turning the PTV ON to prevent damage to the horizontal output transistor and/or CRTs.

1. Connect test generator to the antenna terminal and set for a monoscope pattern.
2. Loosen yoke clamp, seat yoke against bell of CRT and rotate to correct yoke tilt (compare to adjacent CRT). Tighten yoke clamp.
3. Remove adhesive from centering tabs and set centering tabs for zero correction. (figure 25)

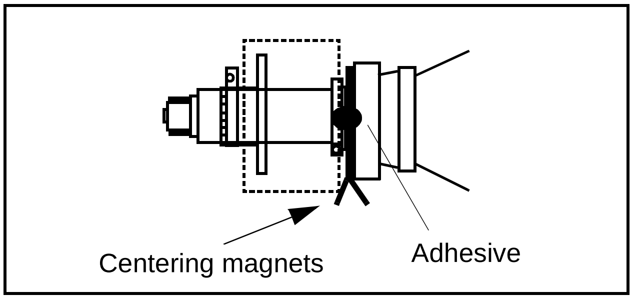


Figure 25. **Adhesive removal**

4. Cover replacement CRT lens and static converge the tubes not replaced, if needed. Check size and linearity of pattern and adjust as required.
5. Uncover replacement CRT lens and cover other two CRT lenses. Adjust electrical and optical focus (lens), if required.
6. Uncover all CRT lenses and use yoke centering magnet to converge replacement CRT (in center area of screen only) with other two CRTs. Disregard non-convergence in areas other than center area.
7. Perform white balance adjustments.

Dynamic focus adjustments

1. Focus adjustments should be performed after 1 hour of aging.
2. Use oscilloscope with 100 : 1 probe.
3. Apply a NTSC crosshatch pattern to adjust focus.
4. Adjust the red, blue and green focus VR on the focus block for best focus of overall picture of each CRT. (figure 28)

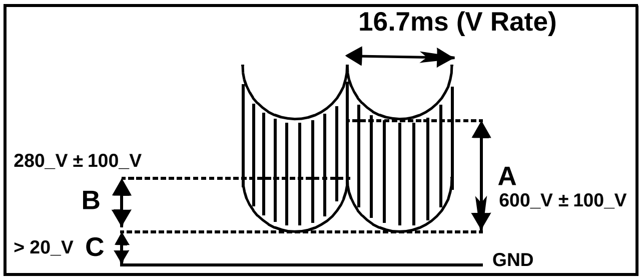


Figure 26. **D. Focus adjustment waveform**

5. To change DAF DATA, enter to service mode, then press POWER on remote to display DACs menu, then select DAC by pressing CH (RIGHT/LEFT) and VOL (UP/DOWN), then press ACTION to enter to DAC, then adjust by pressing VOL (RIGHT/LEFT); press ACTION, to save press ACTION again or OTHER to exit without saving.

Procedure:

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic's TU-DST51 set-top box DTV decoder.*

1. Enter to service mode and set the following default DATA:

	NTSC	NTSC ZOOM	1125i
H-PARA	+317	+263	+317
V-SAW	-23	-35	-23
V-PARA	+69	+117	+69

Note: *The signal (NTSC, 1125i) (NTSC ZOOM option), should be displayed to enter values for specific format adjustment.*

2. For 1125i (1080i) set the default values.
3. For NTSC and NTSC ZOOM apply a white pattern and perform the following steps.
4. Connect the scope probe to TPD30, GND to TPD31.
5. Confirm that level of A is 600_V ± 100_V, adjust H-PAR DAC to set to specification level.
6. Confirm that level of B is 280_V ± 50_V, adjust V-PAR DAC to set to specification level.
7. Confirm that level of C is more tha 20 V, adjust H-PAR DAC to set to specification level.

Focus - Electrical & optical adjustments

(use for minor adjustment or for final adjustment, for complete adjustment see following section.)

Electrical adjustment

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic's TU-DST51 set-top box DTV decoder.*

1. Apply a NTSC crosshatch with dots pattern.

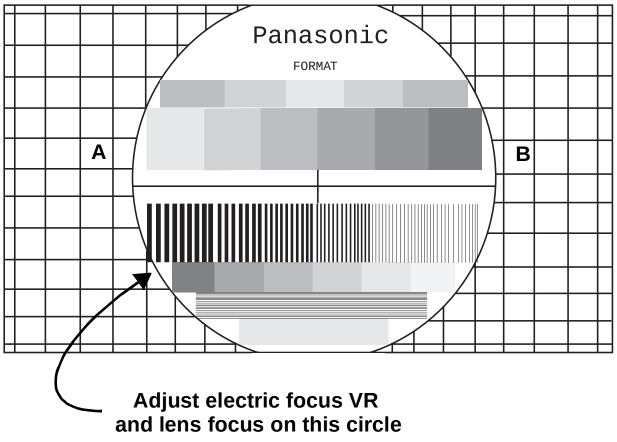


Figure 27. **Lens focus adjustment**

Table 5: **Focus points**

	RED	GREEN	BLUE
Electric focus	B	A/B	A
Optical Focus	B	A/B	A

2. Set VIDEO C_OFF DAC from 00 to 02, and project only red. Adjust red focus VR so that focus is best..

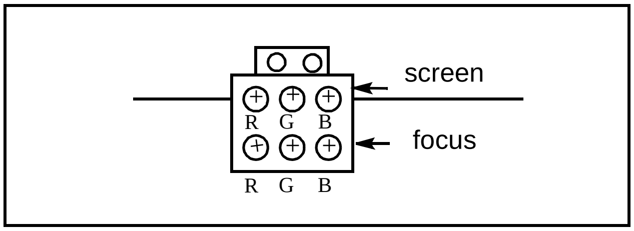


Figure 28. **Focus pack**

3. Adjust red lens focus (mechanical) until focus is best.
4. Adjust red focus VR again.
5. Set VIDEO C_OFF DAC from 00 to 01, and project only green.
6. Repeat steps for green only.
7. Set VIDEO C_OFF DAC from 00 to 03, and project only blue.
8. Repeat steps for blue only.

Focus - Optical lens adjustment

Optical adjustments

Note: *This adjustment normally should not require resetting unless the lens has been replaced or adjustment has changed.*

---

1. Optical focus adjustment is located on the top of each CRT lens system. Loosen the adjustment knurled locking knob. (figure 29)

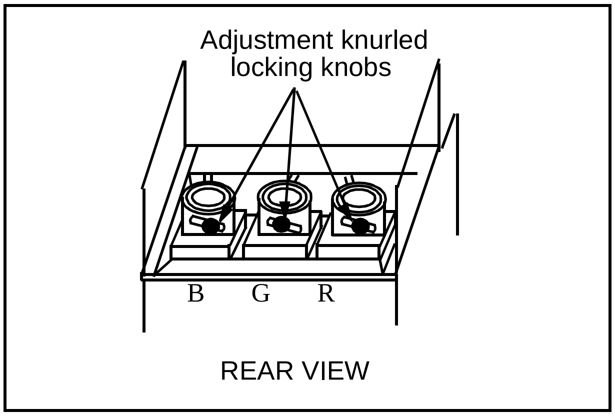


Figure 29. **Optical lens focus adjustment**

2. Turn the PTV ON. Apply and view a crosshatch with dots pattern.
3. Adjust each lens focus for best focus while viewing each CRT.
4. Cover the red and blue CRT, projecting green only. Rotate the green lens for best focus around screen center area.
5. Do the same for the red focus lens while projecting red only.
6. Repeat for blue.

Electric & VM focus adjustment, complete adjustment

(Perform this adjustment when a CRT is replaced or when major adjustment is required)

Preparation:

1. Apply a NTSC crosshatch pattern with dots.
2. Set CONV “MUTE” DAC from 0 to 1 (disabling digital convergence.)
3. Position the longer tab of the four-pole magnet to 90 degrees (uncorrected position). (see figure 31).

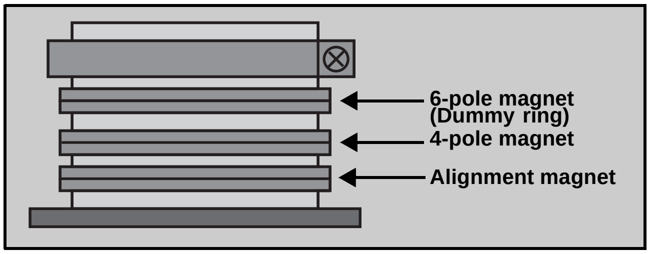


Figure 30. **VM coil with focus correction magnet**

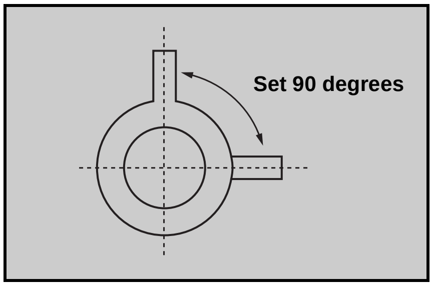


Figure 31. **4-pole magnet**

4. Position the long tab of all alignment magnets and of the dummy ring together in an uncorrected position. (See figure 32).

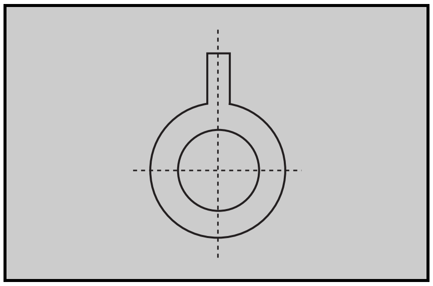


Figure 32. **Alignment magnet (or dummy ring)**

Procedure:

1. Apply an NTSC cross hatch pattern with dots.
2. Assure that digital convergence is disabled (DAC MUTE from 0 to 1).
3. Set VIDEO “C_OFF” DAC from 00 to 02, to project red only.
4. Turn the red electrical focus adjustment VR (on focus pack) fully counterclockwise and note the position of the dots at the center of the picture.
5. Turn the red electrical focus adjustment VR fully clockwise.

6. If the position of the dots at the center of the screen moves from the position noted in step 4., adjust the alignment magnets until the dots are in the same position as noted in step 4.
7. Turn the red electrical focus adjustment VR (on focus pack) fully counterclockwise and confirm that the position of the dots at the center of the screen did not move from their position noted in step 4.
8. If the position of the dots at the center of screen moved, repeat from step 4.
9. If the position of the dots moved after repeated adjustments, adjust until the movement of the dots is minimized.
10. Turn the red focus VR fully clockwise.
11. Adjust the 4-pole magnets until the shape of the dots at the center of the screen is circular.
12. Adjust red focus VR until optimum focus is achieved.
13. Apply NTSC crosshatch with dots or any other available pattern applicable to the following.
14. Confirm that the picture is correctly aligned in the center of the screen, shown in figure 33, adjust the centering magnets. Repeat the alignment magnet adjustments and four pole magnet adjustments (step 1. ~ step 12.).

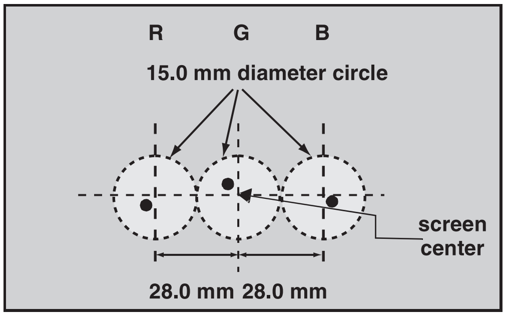


Figure 33. **Centering magnet**

15. Apply an NTSC cross hatch pattern with dots.
16. Set VIDEO “C_OFF” DAC from 00 to 01, to project green only.
17. Repeat above procedures for the green.
18. Set VIDEO “C_OFF” DAC from 00 to 02, to project red only.
19. Repeat above procedures for the blue.
20. Enable digital convergence by changing DAC MUTE from 01 to 00.
21. Following adjustments, paint position of DY centering magnets and fix the centering magnets of DY, dummy rings of VM coil, four pole magnets of VM coil and the alignment magnets of VM coil to prevent them from moving.

Note: *Please See “Service mode (electronic controls)” on page 34 for entering and exiting service mode.*

NTSC Vertical size adjustment (VSIZE)

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

1. Apply a NTSC pattern (see avobe note) .
2. Set VIDEO “C_OFF” DAC from 00 to 01 (to project only green).
3. Adjust centering magnets so that the center of the pattern get aligned with screen frame center.
4. Adjust VDEF “VSIZE” DAC until vertical size is proportional on top and bottom. (See figure 34)
5. Set VIDEO “C_OFF” DAC from 01 to 00

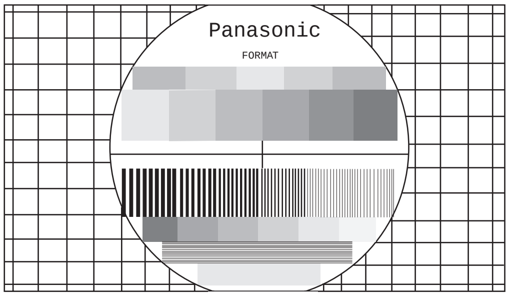


Figure 34. **Vertical size adjustment**

HD 1080i Vertical size adjustment (VSIZE)

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

1. Apply a HD 1080i pattern (see avobe note).
2. Repeat vertical size adjustment from step 2

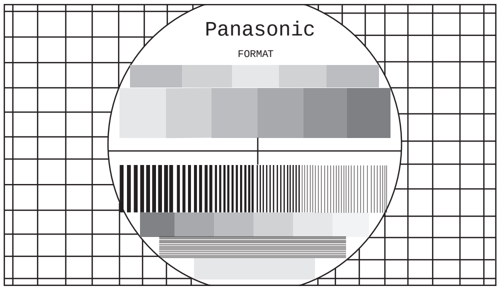


Figure 35. **Vertical size adjustment**

NTSC ZOOM Vertical size adjustment (VSIZE)

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

1. Apply a NTSC pattern (see avobe note) .
2. Change aspect to ZOOM mode.
3. Repeat vertical size adjustment from step 2
4. Try making circle seem rounded (in proportion)

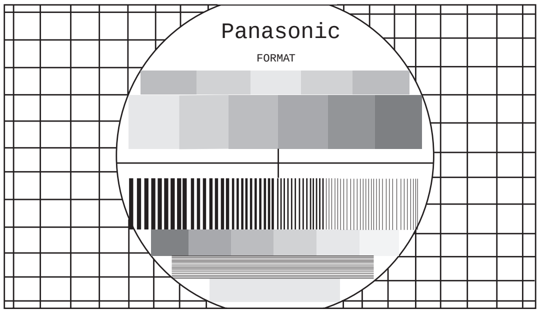


Figure 36. **Vertical size adjustment**

NTSC Horizontal phase adjustment (H-POS)

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

1. Apply a NTSC crosshatch pattern with dots.
2. Set CONV “MUTE” DAC from 00 to 01 (disabling digital convergence).
3. Set VIDEO “C_OFF” DAC from 00 to 01 to project only green.
4. Turn green deflection yoke until line is perfectly horizontal.
5. Adjust H-POS DAC data so that pattern is in the center of screen.

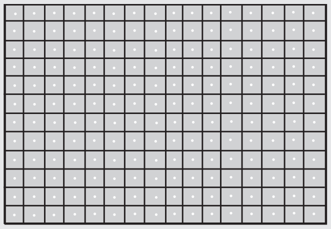


Figure 37. **H phase adjustment**

6. Enable digital convergence by changing DAC MUTE from 01 to 00.
7. Set VIDEO “C_OFF” DAC from 01 to 00.

HD 1080i Horizontal phase adjustment (H-POS)

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

1. Apply a HD 1080i pattern.
2. Repeat NTSC horizontal phase adjustment from step 2.

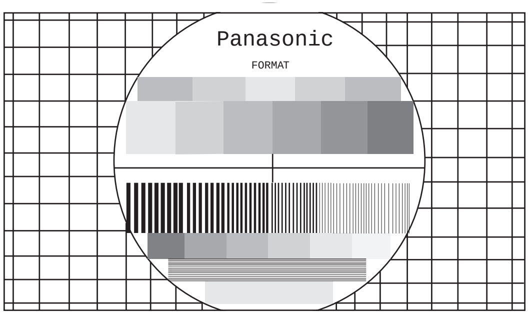


Figure 38. **H Phase adjustment**

Trapezoid adjustment (EWTRA)

1. Set default value

NTSC Pincushion adjustment (PCC)

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

Procedure:

1. Apply a NTSC crosshatch pattern with dots.
2. Set VIDEO “C_OFF” DAC from 00 to 01 to project only green.
3. Set DAC MUTE from 00 to 01 (disabling digital convergence).
4. If the distance at “A” is not 10 ± 5mm, enter “H DEF” “H WID” mode and adjust by VOLUME UP/ DOWN until it is 10 ± 5mm. See figure 39.

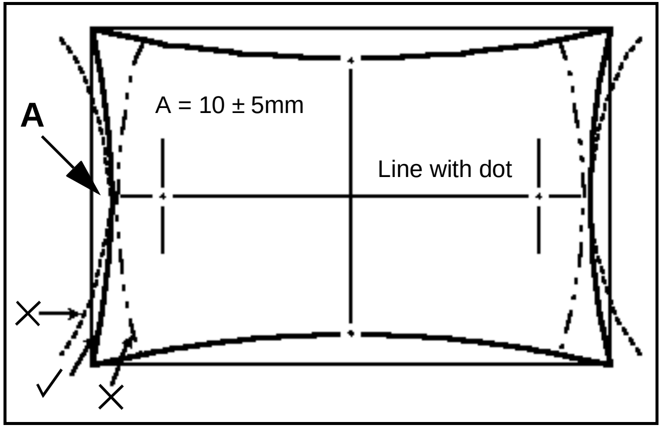
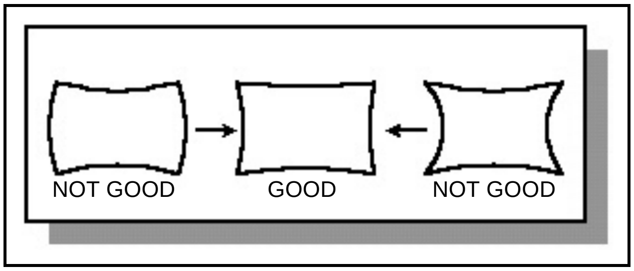


Figure 39. Pincushion adjustment



5. If not all corners of cross hatch appear in screen, enter V DEF “V SIZE” mode and adjust until they appear.

6. Confirm that measurement of “A” has not changed.
7. Enable digital convergence by changing DAC MUTE from 01 to 00.
8. Set VIDEO “C_OFF” DAC from 01 to 00.

HD 1080i Pincushion adjustment (PCC)

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

Procedure:

1. Apply a HD 1080i pattern.
2. Repeat NTSC pincushion adjustment from step 2

Centering magnets adjustment

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

Procedures:

1. Apply a NTSC crosshatch pattern with dots.
2. Set VIDEO “C_OFF” DAC from 00 to 01 to project only green.
3. Set DAC MUTE from 00 to 01 (disabling digital convergence).
4. Loosen the deflection coil screw on the green CRT.
5. Adjust green deflection coil until the horizontal center line is horizontal.
6. Adjust centering magnets until the green pattern is equal on left and right. Adjust also for horizontal and vertical tilt.

***Note:** Push deflection coil to top of CRT neck, then tighten deflection screw after adjusting each CRT centering and tilt.*

---

7. Set VIDEO “C_OFF” DAC from 01 to 03 to project only blue. Adjust deflection coil until the horizontal center line matches the pattern of the grid and is leveled.
8. Adjust blue centering magnets until the pattern center is at the appropriate distance as indicated on figure 40.

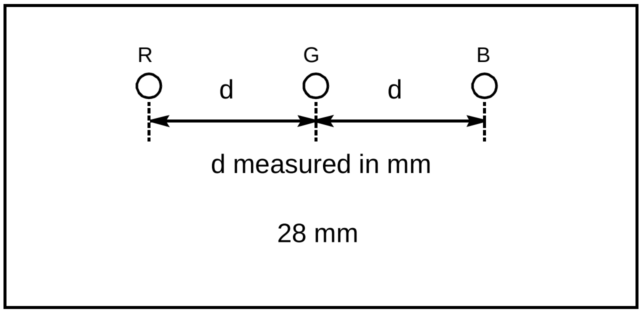


Figure 40. **Centering magnets adjustment.**

9. Set VIDEO “C_OFF” DAC from 01 to 02 to project only red.
10. Adjust red deflection coil until the horizontal center line matches the pattern of the grid and is leveled.
11. Adjust red centering magnets until the pattern center is at the appropriate distance as indicated on figure 40.
12. Enable digital convergence by changing DAC MUTE from 01 to 00.
13. Set VIDEO “C_OFF” DAC from 02 to 00. Following the adjustment, make sure that all deflection coils are pushed completely toward the CRT cones and that all screws are tightened.

NTSC Horizontal size adjustment (H WID)

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

This adjustment is intended to adjust horizontal size of the picture.

1. Apply a NTSC pattern.
2. Set VIDEO “C_OFF” DAC from 00 to 01 to project only green.
3. Set DAC MUTE from 00 to 01 (disabling digital convergence).
4. In service mode, adjust H-WID DAC until the picture horizontal size is balanced at left and right side of screen.
5. Set DAC MUTE from 01 to 00 (disabling digital convergence).
6. Set VIDEO “C_OFF” DAC from 01 to 00.

HD 1080i Horizontal size adjustment (H WID)

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

This adjustment is intended to adjust horizontal size of the picture.

1. Apply a HD 1080i pattern.
2. Repeat NTSC horizontal size adjustment from step 2.

Convergence adjustment

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

Note: *It is strongly recommended to first read and understand the following section prior to make any adjustment.*
Convergence adjustment must be perform for 480i-p (same for interlace & progressive), 1080i and ZOOM 480i.

Turn PTV on and allow it to warm up for 30 minutes prior to making adjustments (WHITE PATTERN).

Note: This PTV uses the scheme described below to correct for misconvergence of the three CRT projection tubes. There are various modes to this operation.

Preparation:

Place the convergence alignment template (see “Convergence alignment template” on page 33) over the PTV screen. Align the center lines of the template with the mechanical center markers on the PTV screen

frame. If the template is not available, create one using the dimensions provided in “Convergence alignment template” on page 33.
Remote control must be used during the procedure.

Note: *Apply the convergence alignment template to the PTV screen frame to converge the **green raster only**. Remove the convergence alignment template following this alignment. The red and blue rasters can then be aligned to the green raster.*

Raster Setup:

1. Enter to service mode (red CHK).
2. In SET-UP (roller guide menu) CONVERGENCE 1 set all values to 0.
3. Cover red & blue lens with caps.
4. Apply a pattern to adjust specific format:
   - **NTSC signal to adjust 480i-p (same for interlace and progressive)**
   - **1080i signal to adjust 1080i**
   - **480i signal with PTV in ZOOM aspect to adjust Z480i**
5. Select DAC COARSE, then press ACTION to enter to “CONVERGENCE ADJ” mode.
6. Press “0” key on remote.
7. Press ACTION key on remote to enter to “TEST_POS” mode.
8. Move pattern by pressing VOL right - left and CH up - down so that the cursor center overlap monoscope pattern center.

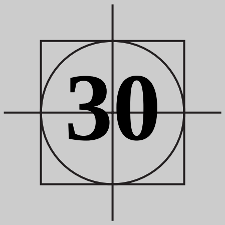


Figure 41. **Aligning cross-hair cursor with center of pattern**

9. Press “5” key on remote to exit superimpose mode (monoscope pattern disappear).
10. Press “TV/VIDEO” key to enter “DATA_POS” mode
11. Adjust by pressing VOL right - left so that peak of curve is the same position as center of cursor.

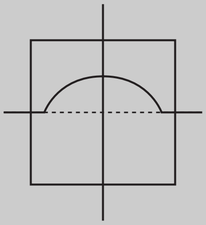


Figure 42. **Symmetrical shape**

12. Press “TV/VIDEO” key on remote to enter “OSD_POS” mode.
13. Press “5” key on remote so that monoscope pattern appears (superimpose mode)
14. Move cursor by pressing VOL right - left and CH up - down so that cursor center overlap monoscope pattern center
15. Press “0” key to go back to “CONVERGENCE ADJ” mode.
16. Press “TV/VIDEO” key to cycle through “COARSE ADJ. MODE” options.

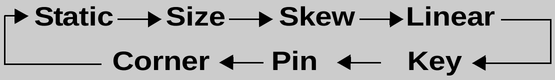


Figure 43. **Coarse modes cycle**

17. To change to “FINE ADJUSTMENT MODE” options (DAC FINE), press “TV/VIDEO” key on remote for at least 3 seconds, to go back to “COARSE ADJ MODE” options press “TV/VIDEO” on remote again for 3 seconds.
18. In “FINE ADJUSTMENT MODE” options, press “MUTE” key on remote to switch between “cursor” mode and “data” mode.
    - ***Cursor mode: Allows cursor movement by pressing VOL right - left and CH up - down.***
    - ***Data mode: Allows making adjustment by pressing VOL right - left and CH up - down.***
19. Either “COARSE ADJUSTMENT MODE” options or “FINE ADJUSTMENT MODE” options, press “R-TUNE” repeatedly key on remote to cycle through different color adjustments (R, G , B, White)
20. To store adjustments press “7”, then “ACTION” key on remote, otherwise press “POWER” then “ACTION” to exit adjustments without saving.
21. Remote functions:
    - **1, 3 . . . . change color view adj**
    - **2 . . . . change pattern**
    - **7 . . . . save data**
    - **5 . . . . overlap**
    - **POWER . . . . to exit**
    - **RECALL . . . . display values**
    - **R-TUNE . . . . cycle colors**
    - **TV/VIDEO . . . . change mode**
      3 secs . . . . change options

Coarse adjustment mode (COARSE)

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

Note: *It is strongly recommended to first read and understand the following section prior to make any adjustment.*
Convergence adjustment must be perform for 480i-p (same for interlace & progressive), 1080i and ZOOM 480i.

Procedure:

1. Enter to “G-SIZE” mode:
   - **DAC COARSE**
   - **Press ACTION on remote**
   - **TV/VIDEO (repeatedly)**
   - **R-TUNE (repeatedly)**

2. Press “2” repeatedly and apply the pattern of border and cross.
3. Press RECALL to display values
4. Adjust size so that the line of the border closes to the screen frame at top, bottom, left and right by pressing CH up-down and VOL right-left.

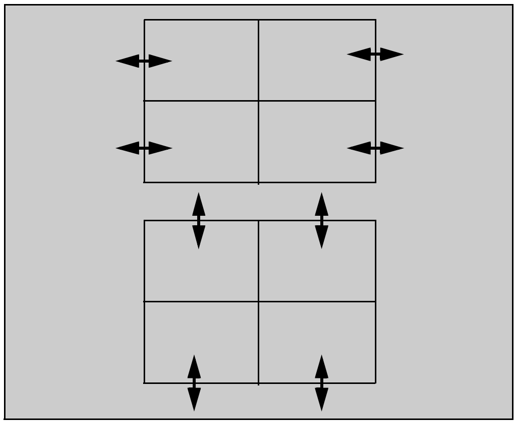


Figure 44. **H & V size adjustment**

5. Press “7” then “ACTION” key on remote to save changes.
6. Enter to linearity “G-LINEAR” mode by pressing “TV/VIDEO”.
7. Adjust linearity by pressing VOL right-left until A=B (see figure 45)

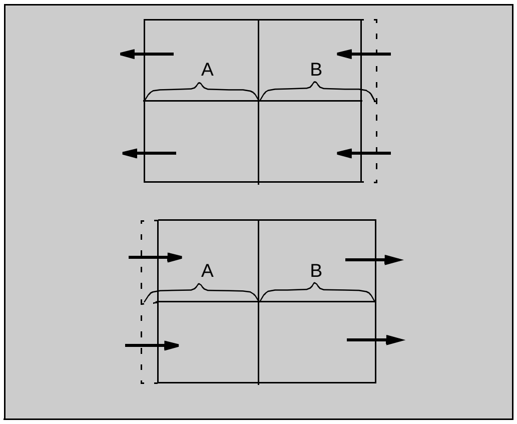


Figure 45. **Linear mode adjustment**

8. Press “7” then “ACTION” key on remote to save changes.
9. Enter to PIN “G-PIN” mode by pressing “TV/ VIDEO”.
10. Adjust V_PIN by pressing CH up-down (see figure 46).
11. Adjust H_PIN by pressing VOL right-left.
12. Press “7” then “ACTION” key on remote to save changes.

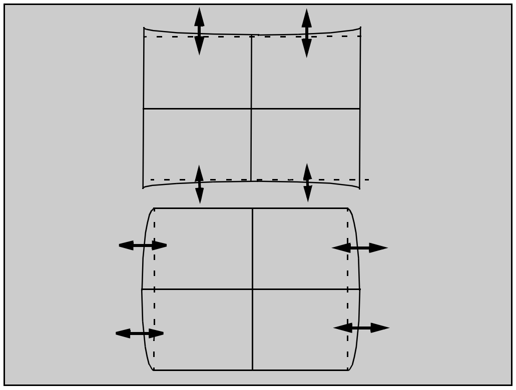


Figure 46. **H & V PIN adjustment**

13. Enter to CORNER “G-CORNER” mode by pressing TV/VIDEO.
14. Adjust by pressing VOL right-left (see figure 47).
15. Press “7” then “ACTION” key on remote to save changes.

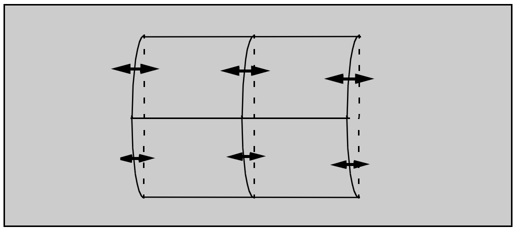


Figure 47. **Corner adjustment**

16. Enter to KEY “G-KEY” mode by pressing TV/ VIDEO.
17. Adjust by pressing CH up-down (see figure 48)
18. Press “7” then “ACTION” key on remote to save changes

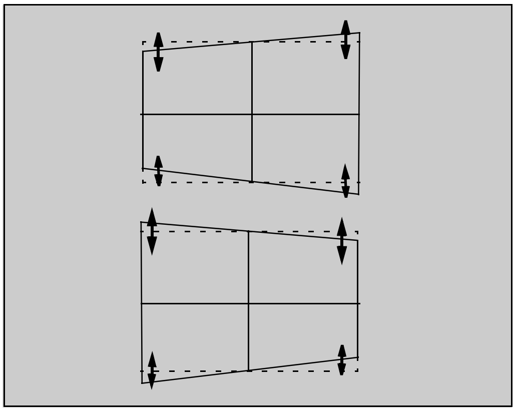


Figure 48. **KEY mode adjustment**

Note: *Confirm that pattern looks like a square and almost overlaps the screen frame, check that vertical and horizontal line center match with the marks on screen frame, if linearity is not good enough, repeat adjustments.*

19. Enter to “STATIC” mode by pressing TV/VIDEO.
20. Press “1” or “3” repeatedly until green and red only are shown.

21. Adjust “R-STATIC” so that the center of red overlaps with the center of green.

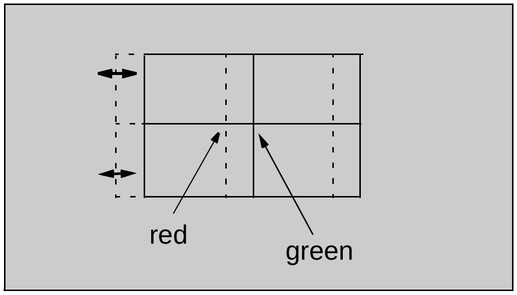


Figure 49. **STATIC mode adjustment**

22. Enter to SKEW “R-SKEW” mode by pressing TV/VIDEO
23. Adjust “R-SKEW” so that the vertical and horizontal line of center overlaps with green (see figure 50)
24. Press “7” then “ACTION” key on remote to save changes.

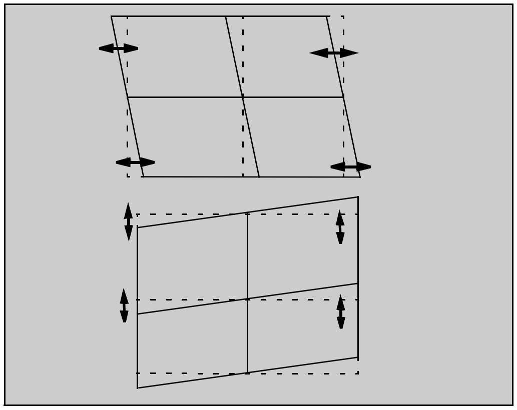


Figure 50. **SKEW adjustment**

Note: *Remember always save data following each adjustment by pressing “7” key on remote, then ACTION.*

25. Enter to LINEARITY “R-LINEAR” mode by pressing TV/VIDEO.
26. Adjust Horizontal linearity (see figure 45)
27. Enter to SIZE “R-SIZE” mode by pressing TV/VIDEO
28. Adjust so that the line on the border closes to the screen frame at top, bottom, left and right (see figure 44)
29. Enter to PIN “R-PIN” mode by pressing TV/VIDEO
30. Adjust horizontally and vertically (see figure 46)
31. Enter to CORNER “R-CORNER” mode by pressing TV/VIDEO.
32. Adjust corners (see figure 47)
33. Enter to KEY “R-KEY” mode by pressing TV/VIDEO
34. Adjust KEY (see figure 48)
35. Display pattern of border and cross, then check that red overlaps green pattern, if it is not satisfactory, repeat from step 19.
36. Enter to STATIC “B-STATIC” mode.
37. Press “1 or 3” key repeatedly on remote until only green and blue pattern are displayed
38. Adjust B-STATIC so that the center of blue overlaps with the center of green (see figure 51).

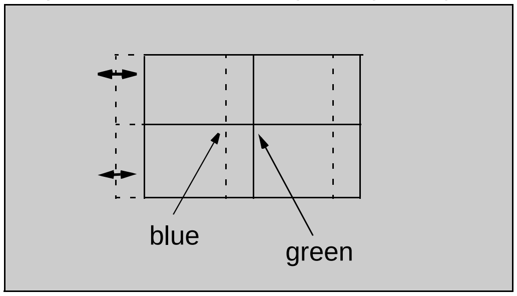


Figure 51. **B-STATIC adjustment**

39. Perform all adjustments for blue (B-SKEW, B-LINEAR, B-SIZE, B-PIN, B-CORNER, B-KEY)
40. Display border and cross pattern and confirm that blue overlaps with green pattern, if it is not satisfactory, repeat for blue.
41. Press “1 or 3” key repeatedly on remote until green, red and blue (white), confirm that red and blue overlaps with green pattern.
42. Press “7” key on remote, then ACTION to save changes.
43. Press POWER then ACTION to exit adjustments or press TV/VIDEO for at least 3 seconds to change to Fine Adjustment Mode.

Fine adjustment mode (FINE) (convergence)

Note: *It is strongly recommended to first read and understand the following section prior to make any adjustment.*
Convergence adjustment must be perform for 480i-p (same for interlace & progressive), 1080i and ZOOM 480i.

Helpful hint:

The easiest way to adjust convergence is to begin from the center of the screen, to the border in all the convergence adjustments.

Remote functions:

• 1, 3.	change color view adj
• 2.	change pattern
• 7.	save data
• 5.	overlap
• POWER	to exit
• RECALL.	display values
• R-TUNE	cycle colors
• TV/VIDEO	change mode
3 secs	change options
• MUTE (“fine”).	cursor & data mode

About pattern:

- NTSC to adjust 480ip (same for interlace and progressive)
- 1080i to adjust 1080i
- 480i with ptv in zoom aspect to adjust Z480i

In “FINE ADJUSTMENT MODE” options, press “MUTE” key on remote to switch between “cursor” mode and “data” mode.

- Cursor mode (cursor flashing): Allows cursor movement by pressing VOL right - left and CH up - down.
- Data mode (cursor fixed): Allows making adjustment by pressing VOL right - left and CH up - down.

Procedure:

1. Enter to “G-EASY” mode (for green):
   - DAC EASY
   - Press POWER on remote
   - TV/VIDEO (repeatedly)
   - R-TUNE (repeatedly)
2. Press “2” repeatedly and apply the pattern of crosshatch.
3. Press “1 or 3” repeatedly until the pattern becomes green.
4. Press RECALL to display values.
5. In “EASY” mode, the adjustment value changes by 4 steps
6. EASY mode allows to move lines horizontally and vertically from the center of cursor.

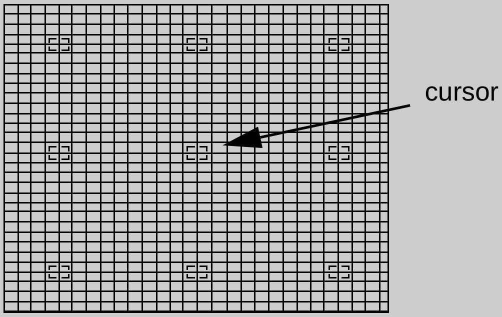


Figure 52. **EASY adjustment cursor positions**

7. This mode afects a wide area around the cursor than other adjustment modes, See values on screen by pressing RECALL on remote (see figure 53)
8. Begin adjustment from the center to the edge of the screen.
9. Adjust by pressing CH up/down and VOL right/left on the remote control when the cursor is not flashing, if the cursor is flashing press MUTE on the remote.

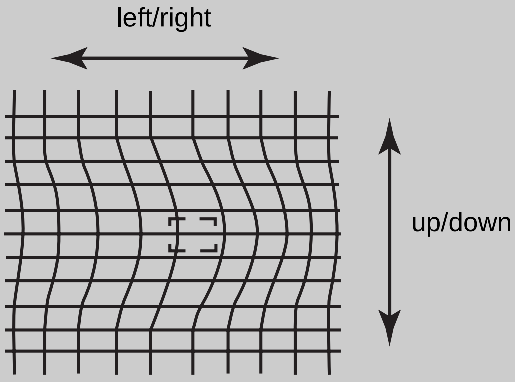


Figure 53. **EASY adjustment**

10. To move the cursor press MUTE on the remote (cursor flashes), then move the cursor to any of the 9 positions for “EASY” mode(see figure 52)
11. This adjustment may help to make rounded lines become straight lines
12. Adjust to make lines as straight as possible
13. Enter to POINT “G-POINT” (for green) mode by pressing TV/VIDEO.
14. “POINT” mode allows to move line horizontally and vertically from the perimeter of cursor making rounded lines become straight (see figure 54)
15. In “POINT” mode, the adjustment data changes by 2 steps, See values on screen by pressing RECALL on remote.

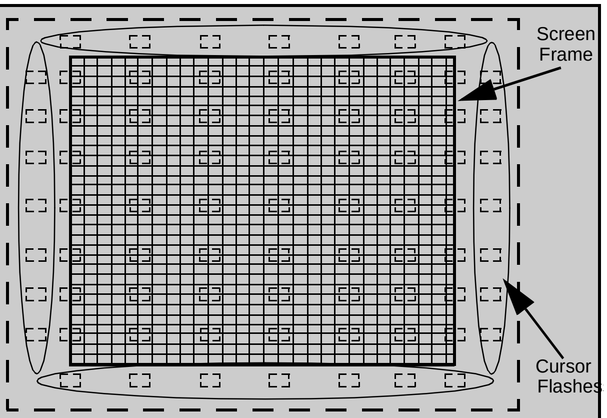


Figure 54. **POINT & ORIG. POINT cursor positions**

16. When the cursor is located in the outer area of the border the cursor starts to flash from one side to other and the adjustment is for the non-visible area (inside the ovals area, see figure 54); This applies to “LINE”, “POINT” & “ORIGIN. POINT” modes.
17. Begin adjustment from the center to the edge of the screen.

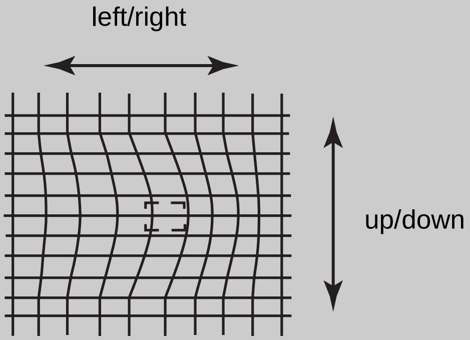


Figure 55. **POINT & ORIG. POINT adjustment**

18. Adjust to make lines as much straight as possible
19. When slightly adjustment is needed, use “ORIG. POINT” mode.
20. To enter to “G-ORIG. POINT” (for green) mode press TV/VIDEO.
21. With “ORIG. POINT”, the adjustment data changes by 1 step, this allows more detail in the adjustment. Display values on screen by pressing RECALL on remote

22. Confirm that green adjustment is good enough, if adjustment is not satisfactory, repeat adjustments.
23. Enter to LINE "G-LINE" mode by pressing TV/VIDEO.
24. LINE mode allows to move each single line horizontally and vertically (see figure 57).
25. Begin adjustment from the center to the edge of the screen (see figure 56)
26. Adjust to make distribute lines

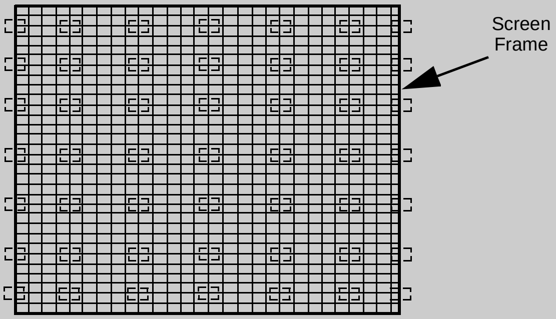


Figure 56. **LINE adjustment cursor positions**

27. Then press "1 or 3" on the remote until red and green appears.

Note: *Since convergence adjustment will not allows to adjust every single cross section of the grid, it is very important to adjust, so that overall looks best.*

.

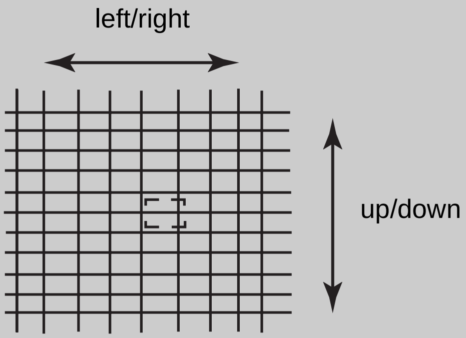


Figure 57. **LINE adjustment**

28. Perform adjustments for red so that red overlaps green, do not move green.
29. Press "1 or 3" on the remote until yellow (red and green) and blue appears, do not move green or red.
30. Perform adjustments so that blue overlaps Yellow (red and green).
31. Press "1 or 3" key on remote to display red, green and blue (white).
32. At this point the crosshatch pattern should look white
33. If the crosshatch pattern is not only white, repeat adjustment for that color (red or blue)
34. Once the crosshatch pattern looks only white, perform the adjustments for White ("POINT", "ORIG. POINT" & "LINE"), notice that each adjustment is only for white (red, green, blue)
35. Adjust white for a good line distribution and make lines completely straight.
36. Press "7" key on remote, then ACTION to save changes.
37. Press POWER then ACTION to exit convergence adjustments (DACs menu appears).

Horizontal and vertical size check

1. Apply a pattern that permits to check that horizontal and vertical proportion of the image is correct.

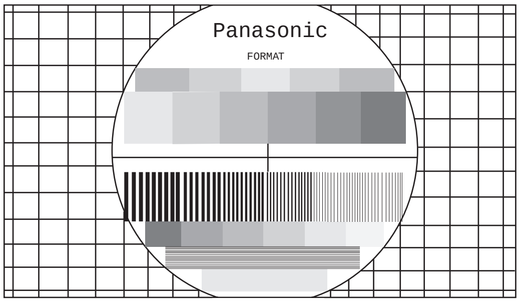


Figure 58. **H & V size check**

Note: *1080i, 480p, 480i pattern obtained from Panasonic's TU-DST51 set-top box DTV decoder.*

2. Confirm that horizontal and vertical center of the picture is located in the center of the screen.
3. Check that the image is proportional horizontally and vertically, proportion is different on every aspect.

Convergence alignment template

The **convergence alignment template** is a grid approximately the size of the viewing screen used to ensure the proper size and shape of the alignment rasters. It is 6 blocks across by 6 blocks high. The grid dimensions vary with the mode of operation.

Apply a **convergence alignment template** to the viewing screen of the PTV. Make sure the center lines are properly aligned. If a template is not available, one can be created by following the instructions below.

Create a convergence alignment template by drawing a pattern, as in figure 59, in the actual dimensions on transparent film or tracing paper. Start with the Horizontal and Vertical Center Axis and work outwards until the pattern is complete. Pay attention to the actual dimensions of the pattern.

Grid dimensions:

47" Models: 1036mm horizontal X 584mm vertical.

Note: *A convergence alignment template, part number **TXFQD01ESER1 for 47",** is available through Matsushita/Panasonic Services.*

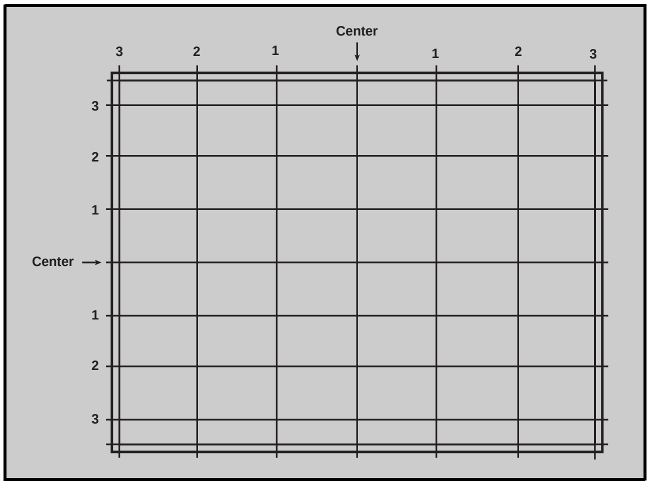


Figure 59. **Convergence adjustment grid**

Service mode (electronic controls)

This receiver has electronic technology using the I²C bus concept. It performs as a control function and it replaces many mechanical controls. Instead of adjusting mechanical controls individually, many of the control functions are now performed by using “on screen display menu”. (The **service adjustment mode**.)

Note: *It is suggested that the technician reads all the way through and understand the following procedure for entering/exiting the* ***service adjustment mode****; then proceed with the instructions working with the receiver. When becoming familiar with the procedure, the flow chart for service mode may be used as a quick guide.*

Quick entry to service mode:

When minor adjustments need to be done to the electronic controls, the method of entering the service mode without removal of the cabinet back is as follows using the remote control:

1. Select SET-UP icon and select CABLE mode.
2. Select TIMER icon and set SLEEP time for 30 Min.
3. Press “ACTION” twice to exit menus.
4. Tune to the Channel 124.
5. Adjust VOLUME to minimum (0).
6. Press VOL ◀ (decrease) **on receiver**. Red “CHK” appears in upper corner.

Note: *After receiver is set into SERVICE MODE, set TIMER back to NO.*

To toggle between aging and service modes:

While the “CHK” is displayed on the left top corner of the CRT, pressing “ACTION” and “VOL” UP on the TV simultaneously will toggle between the modes. Red “CHK” for service mode and yellow “CHK” for Aging.

7. **Press POWER** on the **remote control** to display the service adjustment modes menu, select adjustment by pressing the VOL right/left buttons and CH up/down buttons on the remote and ACTION to enter the adjustment.

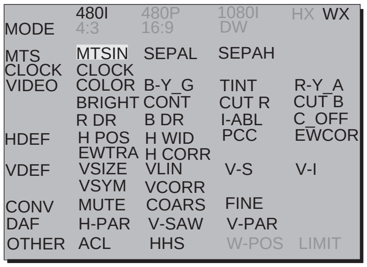

480I 480P 1080I HX WX
MODE 4:3 16:9 DW
MTS MTSIN SEPAL SEPAH
CLOCK CLOCK
VIDEO COLOR B-Y_G TINT R-Y_A
BRIGHT CONT CUT R CUT B
R DR B DR I-ABL C_OFF
HDEF H POS H WID PCC EWCOR
EWTRA H CORR
VDEF VSIZE VLIN V-S V-I
VSYM VCORR
CONV MUTE COARS FINE
DAF H-PAR V-SAW V-PAR
OTHER ACL HHS W-POS LIMIT

Figure 60. Service mode menu adjustments.

Note: *Some adjustments are available only in some modes (480i, 480p, 1080i); it is needed to apply the format; For some adjustments is required to perform adjustment for each format; convergence adjustment must be perform for 480i-p (same for interlace & progressive), 1080i and ZOOM 480i. A 1080i, 480p, 480i pattern can be obtained from Panasonic’s TU-DST51 set-top box DTV decoder.*

Exiting the service mode:

This PTV goes out from service mode when it is unpluged or turned OFF. To exit the service mode, turn the TV OFF or unplug the PTV from AC.

Other method

Press **ACTION** and **POWER** on the **receiver** simultaneously for at least 2 seconds.

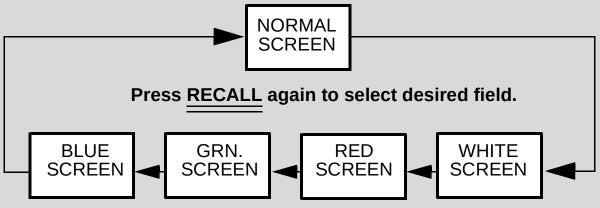
The receiver momentarily shuts off; then comes back on tuned to channel 3 with a preset level of sound.

Any programmed channels, channels caption data and some others user defined settings will be erased when exited by pressing ACTION and POWER on receiver.

IMPORTANT NOTE:
Always check that the PTV exits
the service mode.

To check colors:

Press **RECALL** on the **remote control** when in service mode (red “CHK” is displayed) to enter the purity field check mode.


NORMAL SCREEN
BLUE SCREEN
GRN. SCREEN
RED SCREEN
WHITE SCREEN

Press RECALL again to select desired field.

Figure 61. Colors check.

Table of the service adjustment item available for each format

Signal Formated		**Format**		
		480i	**480p**	**1080i**
	MTS			
MTSIN	*INPUT LEVEL*	*X*	*N/A*	*N/A*
SEPAL	LOW LEVEL SEPARATION	*X*	*N/A*	*N/A*
SEPAH	*HIGH LEVEL SEPARATION*	*X*	*N/A*	*N/A*
	CLOCK			
CLOCK	*CLOCK*	*X*	*N/A*	*N/A*
	VIDEO			
COLOR	*COLOR*	*X*	*N/A*	*X*
TINT	TINT	*X*	*N/A*	*X*
BRIGHT	*SUB-BRIGHTNESS*	*X*	*N/A*	*X*
CONT	*SUB-CONTRAST*	*X*	*N/A*	*X*
B-G_Y	*MAGENTA TINT ADJ*	*X*	*N/A*	*X*
R-Y_A	*YELLOW TINT ADJ*	*X*	*N/A*	*X*
CUT-R	*RED CUT-OFF*	*X*	*N/A*	*X*
CUT-B	*BLUE CUT-OFF*	*X*	*N/A*	*X*
R DR	*RED DRIVE*	*X*	*N/A*	*X*
B DR	*BLUE DRIVE*	*X*	*N/A*	*X*
I ABL	*ABL*	*X*	*X*	*X*
C_OFF	*COLOR ADJ. CUT-OFF*	*X*	*X*	*X*
	HDEF			
H POS	*HORIZONTAL POSITIONING*	*X*	*N/A*	*X*
HWID	*HORIZONTAL WIDTH*	*X*	*N/A*	*X*
PCC	*PINCUSHION CORRECTION*	*X*	*N/A*	*X*
EWCOR	*CORNER CORRECTION*	*X*	*N/A*	*X*
EWTRA	*TRAPEZOID*	*X*	*N/A*	*X*
HCORR	*HORIZONTAL CORRECTION*	*X*	*N/A*	*X*
	VDEF			
VSIZE	*VERTICAL SIZE*	*X*	*N/A*	*X*
VLIN	*VERTICAL LINEARITY*	*X*	*N/A*	*X*
V-S	*VERTICAL S CORRECTION*	*X*	*N/A*	*X*
V-I	*VERTICAL ENDING CORRECTION*	*X*	*N/A*	*X*
VSYM	*VERTICAL MAGNET CORRECTION*	*X*	*N/A*	*X*

Signal Formated		Format		
		480i	480p	1080i
VCORR	*VERTICAL CORRECTION*	*X*	*N/A*	*X*
	CONV			
MUTE	*DIGITAL CONV (ON/OFF)*	*X*	*X*	*X*
COARS	*COARSE ADJUSTMENT*	*X*	*X*	*X*
FINE	*FINE ADJUSTMENT*	*X*	*X*	*X*
	DAF			
H-PAR	*HORIZONTAL PARABOLA*	*X*	*X*	*X*
V-SAW	*VERTICAL SAW*	*X*	*X*	*X*
V-PAR	*VERTICAL PARABOLA*	*X*	*X*	*X*
	OTHER			
ACL	---------------	*X*	*N/A*	*X*
HHS	----------------	*X*	*N/A*	*X*

Note: *PTV detects automatically the format of the input signal (480i, 480p or 1080i)*

480i Service mode (electronic controls, continued)

Note: *Registers marked as* ***FIXED*** *are factory preset, the default value must not be changed*

Important note:

Write down the original values ("b" in the adjustment mode details, figure 60) for each address adjustment before modifying values.

Follow the procedure below to access the various service adjustments. (Same procedures applies to each section.)

a. Press

CH ▲▼ buttons on the remote control to select any of the seven service sub adjustment addresses. ("a" in figure 60)

b. Press

The ◀ ▶ buttons on the remote control to adjust the level of the selected service adjustments.

MTS Adjustments	**Description**	**Default Level**	**New Level**
MTSIN	INPUT LEVEL	21	
SEPAL	LOW LEVEL SEPARATION	06	
SEPAH	HIGH LEVEL SEPARATION	1A	
CLOCK Adjustments	**Description**	**Default Level**	**New Level**
CLOCK	CLOCK	128	
VIDEO Adjustments	**Description**	**Default Level**	**New Level**
COLOR	COLOR	13	
TINT	TINT	80	
BRIGHT	SUB-BRIGHTNESS	01 DB	
CONT	SUB-CONTRAST	89	
B-Y_G	MAGENTA TINT ADJ	40	
R-Y_A	YELLOW TINT ADJ	80	
CUT R	RED CUT-OFF	01 FB	
CUT B	BLUE CUT-OFF	01 EC	
R DR	RED DRIVE	57	
B DR	BLUE DRIVE	70	
I ABL	ABL	VARIABLE	
C_OFF	COLOR ADJ. CUT-OFF	00	
HDEF Adjustments	**Description**	**Default Level**	**New Level**
H POS	HORIZONTAL POSITIONING	01 48	
H WID	HORIZONTAL WIDTH	1D	
PCC	PINCUSHION CORRECTION	20	
EWCOR	CORNER CORRECTION	03	
EWTRA	TRAPEZOID	08	
HCORR	HORIZONTAL CORRECTION	0D	

Note: *Registers marked as **FIXED** are factory preset, the default value must not be changed*

Important note:

Write down the original values ("b" in the adjustment mode details, figure 60) for each address adjustment before modifying values.

Follow the procedure below to access the various service adjustments. (Same procedures applies to each section).

a. Press

CH ▲▼ buttons on the remote control to select any of the seven service sub adjustment addresses. ("a" in figure 60)

b. Press

The ◀ ▶ buttons on the remote control to adjust the level of the selected service adjustments.

VDEF Adjustment	Description	Default Level	New Level
VSIZE	VERTICAL SIZE	00	
VLIN	VERTICAL LINEARITY	10	
V-S	VERTICAL S CORRECTION	0A	
V-I	VERTICAL ENDING CORRECTION	0F (DEFAULT)	
VSYM	VERTICAL MAGNET CORRECTION	04 (DEFAULT)	
VCORR	VERTICAL CORRECTION	0C	
CONV Adjustments	**Description**	**Default Level**	**New Level**
MUTE	DIGITAL CONV (ON/OFF)	00	
COARS	COARSE ADJUSTMENT	ADJUSTMENT	
FINE	FINE ADJUSTMENT	ADJUSTMENT	
DAF Adjustments	**Description**	**Default Level**	**New Level**
H-PAR	HORIZONTAL PARABOLA	+317	
V-SAW	VERTICAL SAW	-23	
V-PAR	VERTICAL PARABOLA	+69	
OTHER Adjustments	**Description**	**Default Level**	**New Level**
ACL	-------	01 CO	
HHS	-------	01 CO	

About format aspect switching (WX 16:9 or HX 4:3):

Widescreen 16:9 and non-widescreen 4:3 PTVs use the same light box, for this reason is important to set it to the correct version (16:9 or 4:3). To change the format please refer to figure 62 on page 43.
Be sure to select the correct format for the serviced PTV.

480p Service mode (electronic controls, continued)

Note: *Registers marked as **FIXED** are factory preset, the default value must not be changed*

Important note:
Write down the original values ("b" in the adjustment mode details, figure 60) for each address adjustment before modifying values.

Follow the procedure below to access the various service adjustments. (Same procedures applies to each section.)

a. Press

CH ▲▼ buttons on the remote control to select any of the seven service sub adjustment addresses. ("a" in figure 60)

b. Press

The ◀ ▶ buttons on the remote control to adjust the level of the selected service adjustments.

MTS Adjustments	Description	Default Level	New Level
MTSIN	INPUT LEVEL	N/A	
SEPAL	LOW LEVEL SEPARATION	N/A	
SEPAH	HIGH LEVEL SEPARATION	N/A	
CLOCK Adjustments	**Description**	**Default Level**	**New Level**
CLOCK	CLOCK	N/A	
VIDEO Adjustments	**Description**	**Default Level**	**New Level**
COLOR	COLOR	N/A	
TINT	TINT	N/A	
BRIGHT	SUB-BRIGHTNESS	N/A	
CONT	SUB-CONTRAST	N/A	
B-Y_G	MAGENTA TINT ADJ	N/A	
R-Y_A	YELLOW TINT ADJ	N/A	
CUT R	RED CUT-OFF	N/A	
CUT B	BLUE CUT-OFF	N/A	
R DR	RED DRIVE	N/A	
B DR	BLUE DRIVE	N/A	
I ABL	ABL	VARIABLE	
C_OFF	COLOR ADJ. CUT-OFF	00	
HDEF Adjustments	**Description**	**Default Level**	**New Level**
H POS	HORIZONTAL POSITIONING	N/A	
H WID	HORIZONTAL WIDTH	N/A	
PCC	PINCUSHION CORRECTION	N/A	
EWCOR	CORNER CORRECTION	N/A	
EWTRA	TRAPEZOID	N/A	
HCORR	HORIZONTAL CORRECTION	N/A	

Note: *Registers marked as* ***FIXED*** *are factory preset, the default value must not be changed*

Important note:
Write down the original values ("b" in the adjustment mode details, figure 60) for each address adjustment before modifying values.

Follow the procedure below to access the various service adjustments. (Same procedures applies to each section).

a. Press

CH ▲▼ buttons on the remote control to select any of the seven service sub adjustment addresses. ("a" in figure 60)

b. Press

The ◀ ▶ buttons on the remote control to adjust the level of the selected service adjustments.

VDEF Adjustment	Description	Default Level	New Level
VSIZE	VERTICAL SIZE	N/A	
VLIN	VERTICAL LINEARITY	N/A	
V-S	VERTICAL S CORRECTION	N/A	
V-I	VERTICAL ENDING CORRECTION	N/A	
VSYM	VERTICAL MAGNET CORRECTION	N/A	
VCORR	VERTICAL CORRECTION	N/A	
CONV Adjustments	**Description**	**Default Level**	**New Level**
MUTE	DIGITAL CONV (ON/OFF)	00	
COARS	COARSE ADJUSTMENT	ADJUSTMENT	
FINE	FINE ADJUSTMENT	ADJUSTMENT	
DAF Adjustments	**Description**	**Default Level**	**New Level**
H-PAR	HORIZONTAL PARABOLA	+317	
V-SAW	VERTICAL SAW	-23	
V-PAR	VERTICAL PARABOLA	+69	
OTHER Adjustments	**Description**	**Default Level**	**New Level**
ACL	-------	01 CO	
HHS	-------	01 CO	

About format aspect switching (WX 16:9 or HX 4:3):

Widescreen 16:9 and non-widescreen 4:3 PTVs use the same light box, for this reason is important to set it to the correct version (16:9 or 4:3). To change the format please refer to figure 62 on page 43.
Be sure to select the correct format for the serviced PTV.

1080i Service mode (electronic controls, continued)

Note: *Registers marked as **FIXED** are factory preset, the default value must not be changed*

Important note:
Write down the original values ("b" in the adjustment mode details, figure 60) for each address adjustment before modifying values.

Follow the procedure below to access the various service adjustments. (Same procedures applies to each section.)

a. Press

CH ▲▼ buttons on the remote control to select any of the seven service sub adjustment addresses. ("a" in figure 60)

b. Press

The ◀ ▶ buttons on the remote control to adjust the level of the selected service adjustments.

MTS Adjustments	Description	Default Level	New Level
MTSIN	INPUT LEVEL	N/A	
SEPAL	LOW LEVEL SEPARATION	N/A	
SEPAH	HIGH LEVEL SEPARATION	N/A	
CLOCK Adjustments	**Description**	**Default Level**	**New Level**
CLOCK	CLOCK	N/A	
VIDEO Adjustments	**Description**	**Default Level**	**New Level**
COLOR	COLOR	1C	
TINT	TINT	80	
BRIGHT	SUB-BRIGHTNESS	02 00	
CONT	SUB-CONTRAST	89	
B-Y_G	MAGENTA TINT ADJ	40	
R-Y_A	YELLOW TINT ADJ	80	
CUT R	RED CUT-OFF	01 FB	
CUT B	BLUE CUT-OFF	01 EC	
R DR	RED DRIVE	57	
B DR	BLUE DRIVE	70	
I ABL	ABL	00	
C_OFF	COLOR ADJ. CUT-OFF	00	
HDEF Adjustments	**Description**	**Default Level**	**New Level**
H POS	HORIZONTAL POSITIONING	00 C2	
H WID	HORIZONTAL WIDTH	2B	
PCC	PINCUSHION CORRECTION	0C	
EWCOR	CORNER CORRECTION	03	
EWTRA	TRAPEZOID	08	
HCORR	HORIZONTAL CORRECTION	0E	

Note: *Registers marked as **FIXED** are factory preset, the default value must not be changed*

Important note:

Write down the original values ("b" in the adjustment mode details, figure 60) for each address adjustment before modifying values.

Follow the procedure below to access the various service adjustments. (Same procedures applies to each section).

a. Press

CH ▲▼ buttons on the remote control to select any of the seven service sub adjustment addresses. ("a" in figure 60)

b. Press

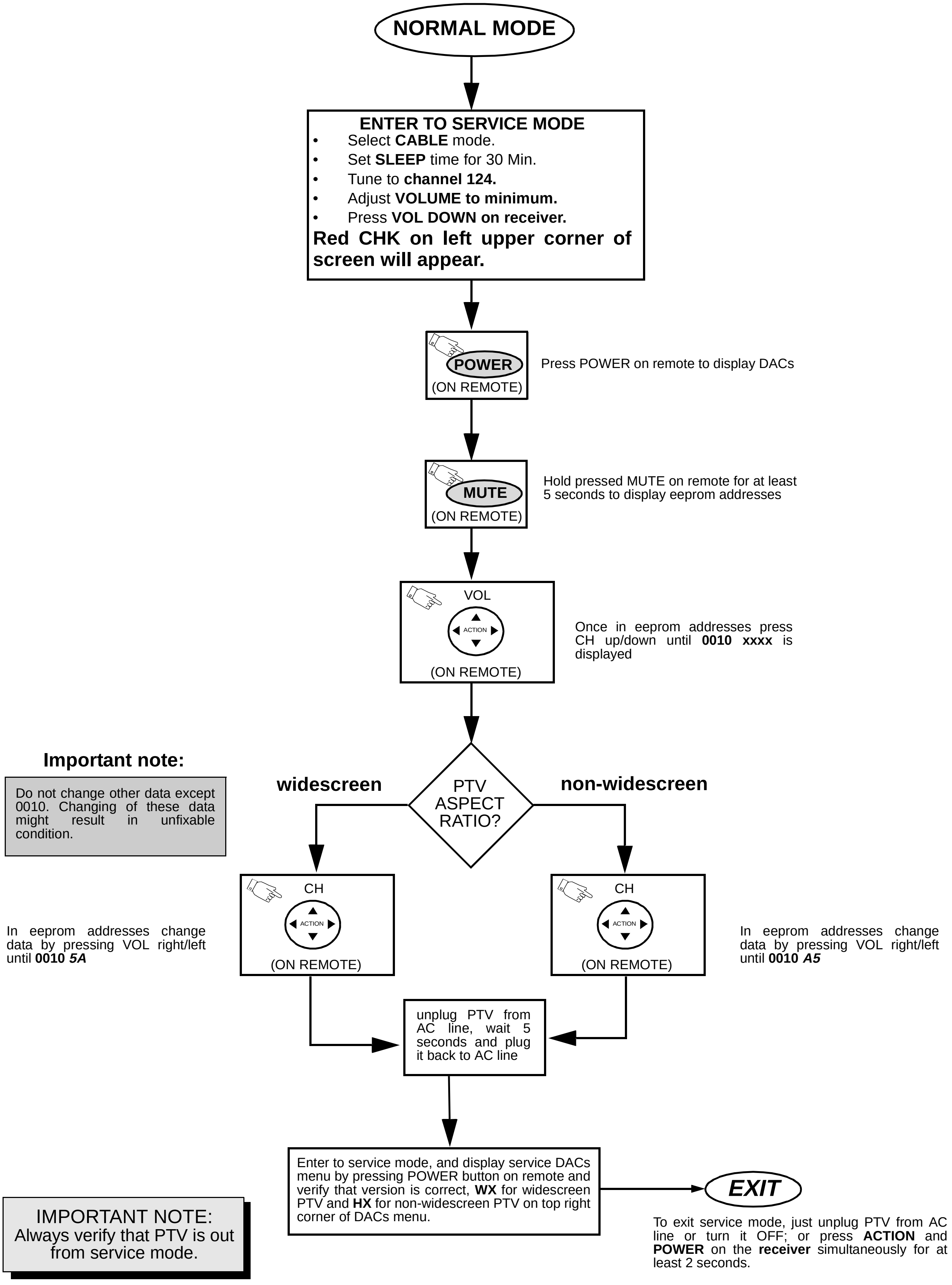
The ◀ ▶ buttons on the remote control to adjust the level of the selected service adjustments.

VDEF Adjustment	Description	Default Level	New Level
VSIZE	VERTICAL SIZE	40	
VLIN	VERTICAL LINEARITY	15	
V-S	VERTICAL S CORRECTION	19	
V-I	VERTICAL ENDING CORRECTION	0F (DEFAULT)	
VSYM	VERTICAL MAGNET CORRECTION	04 (DEFAULT)	
VCORR	VERTICAL CORRECTION	0C	
CONV Adjustments	**Description**	**Default Level**	**New Level**
MUTE	DIGITAL CONV (ON/OFF)	00	
COARS	COARSE ADJUSTMENT	ADJUSTMENT	
FINE	FINE ADJUSTMENT	ADJUSTMENT	
DAF Adjustments	**Description**	**Default Level**	**New Level**
H-PAR	HORIZONTAL PARABOLA	+263	
V-SAW	VERTICAL SAW	-35	
V-PAR	VERTICAL PARABOLA	+117	
OTHER Adjustments	**Description**	**Default Level**	**New Level**
ACL	-------	01 CO	
HHS	-------	01 CO	

About format aspect switching (WX 16:9 or HX 4:3):

Widescreen 16:9 and non-widescreen 4:3 PTVs use the same light box, for this reason is important to set it to the correct version (16:9 or 4:3). To change the format please refer to figure 62 on page 43.
Be sure to select the correct format for the serviced PTV.

Instructional flow chart for format aspect switching (WX 16:9 or HX 4:3)


NORMAL MODE
POWER
(ON REMOTE)
MUTE
(ON REMOTE)
VOL
ACTION
(ON REMOTE)
PTV ASPECT RATIO?
widescreen
non-widescreen
CH
ACTION
(ON REMOTE)
CH
ACTION
(ON REMOTE)
EXIT

ENTER TO SERVICE MODE

- Select **CABLE** mode.
- Set **SLEEP** time for 30 Min.
- Tune to **channel 124.**
- Adjust **VOLUME to minimum.**
- Press **VOL DOWN on receiver.**

Red CHK on left upper corner of screen will appear.

Press POWER on remote to display DACs

Hold pressed MUTE on remote for at least 5 seconds to display eeprom addresses

Once in eeprom addresses press CH up/down until **0010 xxxx** is displayed

Important note:

Do not change other data except 0010. Changing of these data might result in unfixable condition.

In eeprom addresses change data by pressing VOL right/left until **0010 *5A***

In eeprom addresses change data by pressing VOL right/left until **0010 *A5***

unplug PTV from AC line, wait 5 seconds and plug it back to AC line

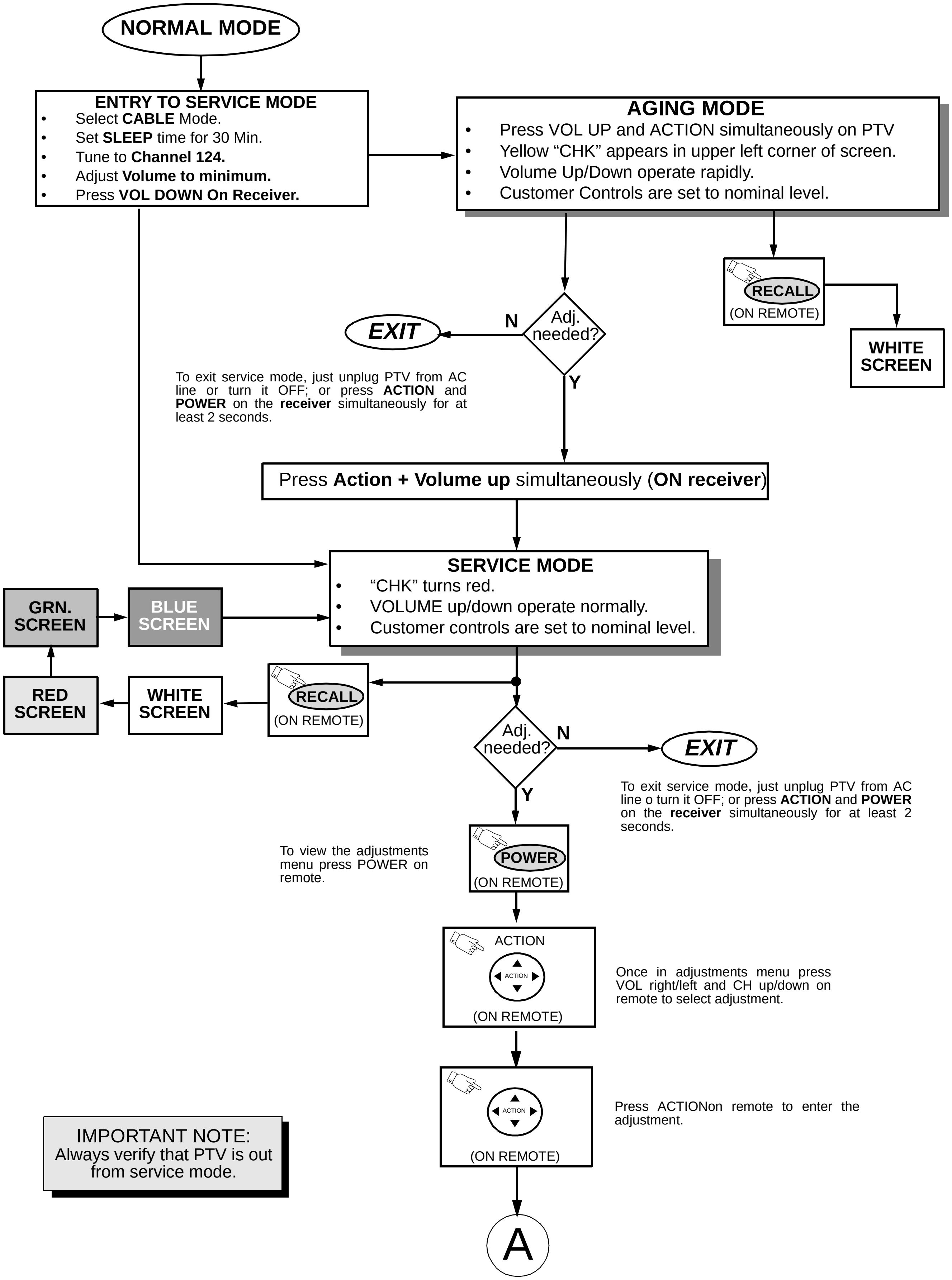
Enter to service mode, and display service DACs menu by pressing POWER button on remote and verify that version is correct, **WX** for widescreen PTV and **HX** for non-widescreen PTV on top right corner of DACs menu.

To exit service mode, just unplug PTV from AC line or turn it OFF; or press **ACTION** and **POWER** on the **receiver** simultaneously for at least 2 seconds.

IMPORTANT NOTE:
Always verify that PTV is out from service mode.

Figure 62.**Flow chart for aspect ratio switching**.

Instructional flow chart for service mode


NORMAL MODE
ENTRY TO SERVICE MODE
• Select CABLE Mode.
• Set SLEEP time for 30 Min.
• Tune to Channel 124.
• Adjust Volume to minimum.
• Press VOL DOWN On Receiver.
AGING MODE
• Press VOL UP and ACTION simultaneously on PTV
• Yellow “CHK” appears in upper left corner of screen.
• Volume Up/Down operate rapidly.
• Customer Controls are set to nominal level.
RECALL
(ON REMOTE)
WHITE SCREEN
EXIT
N
Adj. needed?
Y
Press Action + Volume up simultaneously (ON receiver)
SERVICE MODE
• “CHK” turns red.
• VOLUME up/down operate normally.
• Customer controls are set to nominal level.
GRN. SCREEN
BLUE SCREEN
RED SCREEN
WHITE SCREEN
RECALL
(ON REMOTE)
Adj. needed?
N
EXIT
Y
POWER
(ON REMOTE)
ACTION
ACTION
(ON REMOTE)
ACTION
(ON REMOTE)
A

To exit service mode, just unplug PTV from AC line or turn it OFF; or press **ACTION** and **POWER** on the **receiver** simultaneously for at least 2 seconds.

To exit service mode, just unplug PTV from AC line o turn it OFF; or press **ACTION** and **POWER** on the **receiver** simultaneously for at least 2 seconds.

To view the adjustments menu press POWER on remote.

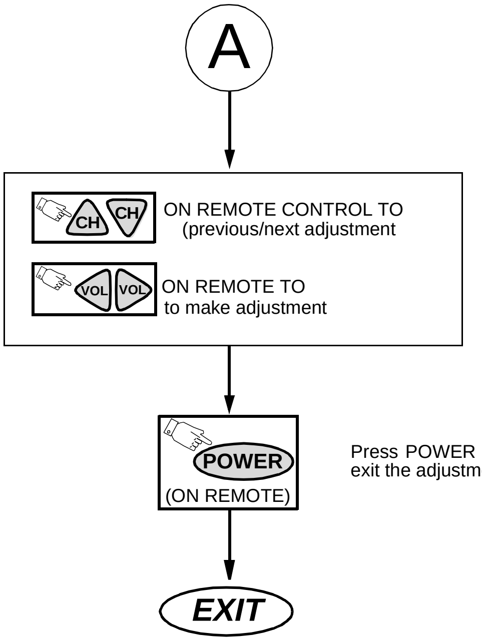
Once in adjustments menu press VOL right/left and CH up/down on remote to select adjustment.

Press ACTIONon remote to enter the adjustment.

IMPORTANT NOTE:
Always verify that PTV is out from service mode.

Figure 63.**Flow chart for service mode.**

Instructional flow chart for service mode - continued


A
CH
CH
ON REMOTE CONTROL TO
(previous/next adjustment
VOL
VOL
ON REMOTE TO
to make adjustment
POWER
(ON REMOTE)
EXIT

Press POWER or ACTION on remote to exit the adjustment.

IMPORTANT NOTE:
Always verify that PTV is out from service mode.

To exit service mode, just unplug PTV from AC line or turn it OFF; or press **ACTION** and **POWER** on the **receiver** simultaneously for at least 2 seconds.

Flow chart for service mode (continued).

NTSC Sub-Bright adjustment (BRIGHT)

Procedure:

1. Set PIC MODE TO VIVID, PICTURE settings to normal, NATURAL COLOR to OFF and COLOR TEMPERATURE to NORMAL.
2. Connect meter (+) to TPD50 and (-) to TPD51.
3. Apply a NTSC color bar with no color or if available a grey levels pattern.
4. Adjust DAC BRIGHT data so that bar near to black bar becomes near black .
5. Apply a white pattern and put user bright control to max. and confirm reading on meter is 12.4±1_V.

1080i Sub-Bright adjustment (BRIGHT)

Procedure:

1. Set same settings as NTSC adjustment
2. Apply a 1080i signal, and repeat adjustments as from step 2 in NTSC adjustment.
3. If pattern is not available, use a color signal in 1080i and adapt the adjustment to that available signal
4. Adjust DAC CONT so that black and white level are in good balance (white is white and black is black)

NTSC Color adjustment (TINT, B-Y_G, R-Y_A)

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic's TU-DST51 set-top box DTV decoder.*

This adjustment requires that the servicer use its skills in observing what a colorbar pattern should looks like.

Preparation:

1. Set the following in the user picture menu as follows:
   PIC MODE:VIVID
   COLOR: center (31)
   PICTURE: max (63)
   BRIGHT: center (31)
   SHARPNESS: min. (0)
   TINT:(31)
   NATURAL COLOR:OFF
   COLOR TEMPERATURE:NORMAL

Procedure:

1. Apply a NTSC color bar pattern
2. Adjust DAC TINT so that the fourth bar from right to left becomes purple and good color balance.
3. If the adjustment is high, the bar will look pinkish, if it is low will look bluish.
4. Adjust B-Y_G so blue look natural, and the rest of the colors become in balance.
5. Adjust R-Y_A so red look natural, and rest of the colors become in balance.
6. Check that white bar is real white, no bluish or redish or tending to become grey.

1080i Color adjustment (TINT, B-Y_G, R-Y_A)

Note: *1080i, 480p, 480i pattern can be obtained from Panasonic's TU-DST51 set-top box DTV decoder.*

1. Set same settings as NTSC adjustment
2. Apply a 1080i signal, and repeat adjustments as from step 2 in NTSC adjustment.
3. If pattern is not available, use a color signal in 1080i and adapt the adjustment to that available signal.

Service mode (electronic controls, continued)

Red, green & blue screen cutoff

1. Use either a no input signal condition or raster from the NTSC generator.
2. Observing the green tube directly or via a reflective surface, adjust the VR on focus pack for the green tube for minimum noise.
3. Adjust the noise level in the red and blue tubes to match the noise level in the green tube.

White balance adjustment

Note: *1080I, 480p, 480I pattern can be obtained from Panasonic's TU-DST51 set-top box DTV decoder.*

Prior to this adjustment, perform sub-contrast adjustment. This adjustment requires that the service use skills in observing what a screen without color should look like (white picture).

1. Enter the service mode.
2. Apply a NTSC black and white pattern to one of the video inputs (see above note) color bar with no color.

High light white balance adjustment

1. Adjust DAC R_DR for red and B_DR for blue adjustments.
2. Make sure the screen is not blue or green. The screen should be white in the white area.
3. Check the black and white area for a black and white picture with even shades of gray and no color tint in the picture.

Low light white balance adjustment

1. Adjust DAC CUT_R for red and DAC CUT_B for blue.
2. Check the screen for even white in all areas, no color.
3. Check the black and white pattern for a black and white picture, even shades of gray and no color tint in the low light areas.
4. Repeat the High Light and Low Light White Balance again until the white balance tracks from high light to low light.

Tint and color check

Set picture mode to VIVID mode.

Again, the service ability to see color and the balance of color is important for theses adjustments.

Tint check

1. In picture menu set PICTURE NORM to YES.
2. Apply color bars to the video input.
3. Magenta is composed of two colors, blue and red.
4. Check to see that magenta does not have too much blue or too much red.
5. Check cyan. Cyan is composed of blue and green. It should not have too much blue or green.
6. Use a test signal from a VCR or laser disk that has a pre-recorded close up of a signal that has good flesh tones.
7. The signal on the VCR or laser disk should look normal.

Color check

Using a clean RF or video signal, set the color level so that it does not saturate or appear harsh. Make sure that color is not set so that it appears dull and washed out. Look for natural colors, try to adjust the picture to appear as a normal photograph.

MTS circuit adjustments

Note: *It is important to adjust the MTS circuit in the order shown below.*

The MTS circuit adjustments require two steps:

1. Input level adjustment.
2. Stereo separation adjustment.

Input level adjustment (MTSIN)

Preparation:

1. Connect an RMS meter (AC range) with filter jig as shown in figure 64 .

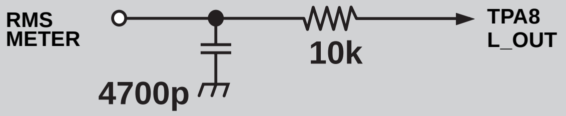


Figure 64. **Filter jig**

2. Connect an RF signal generator to the RF antenna input.

Procedure:

1. Apply the following signal from the RF signal generator:
   Video: 100 IRE flat field, 30% modulation.
   Audio: 300Hz, 100% modulation, monaural (70 ± 5dB, 75Ω open, P/S 10dB). Make sure to turn off 75µs pre-emphasis.
2. Adjust DAC "MTSIN" *MTS-INPUT* data until the voltage measured is 106mV ± 6.0mV RMS.

Stereo separation adjustment (SEPAL & SEPAH)

Preparation:

1. Connect an RF signal generator to the RF antenna input.
2. Connect an oscilloscope probe to TPA7 (R_out).

Procedure:

1. Set PTV to Stereo Mode (in the audio menu).
2. Apply the following signal from the RF signal generator:
   Video: 100 IRE flat field, 30% modulation.
   Audio: 300Hz, 30% modulation, stereo (left only) (70dB ± 5dB, 75Ω OPEN, P/S 10dB).

Note: *Set the 30% modulation with the pilot light SW and N.R. switches OFF then turn them ON while testing.*

3. Adjust MTS low-level separation "SEPAL" DAC data (in the service menu) until the amplitude of the measured waveform on the scope is minimum.

4. Apply the following signal from the RF signal generator:
   Video: 100 IRE flat field, 30% modulation.
   Audio: 3KHz, 30% modulation, stereo (left only).
   (70dB ± 5dB, 75Ω OPEN, P/S 10dB).

Note: *Set the 30% modulation with the P.L and N.R. switches OFF then turn them ON while testing.*

---

5. Adjust MTS High-Level Separation “SEPAH” DAC data until the amplitude of the waveform measured on the scope is minimum.
6. Repeat above steps 2 through 5 until the amplitude is at minimum for both signals.

Clock Adjustment (CLOCK)

Preparation:

Connect the frequency counter from IC001 MPU Pin 10 or TPA009, to cold ground (⏚).

Note: *Frequency Counter probe capacitance should be 8pF or less.*

Procedure:

1. Turn the PTV “ON” with the AC power applied.
2. Measure TPA009 IC001 MPU pin 10 for frequency and record the reading.

Note: *Pin 10 measurement must have at least four digits of resolution following the decimal point. Example: 000.0000*

---

3. Place the PTV into service mode for making electronic adjustment, select the clock adjustment DAC CLOCK and change value to 128.
4. Calculate and set CLOCK based on the following formula:

$$CLOCK = 128 + 0.450x106x\frac{\{732.422 - pin(10)[\mathrm{Hz}]\}}{732.4220}$$

Note: *Pin 10 measurement will not change regardless of the value stored in CLOCK.*

Audio signal path block diagram

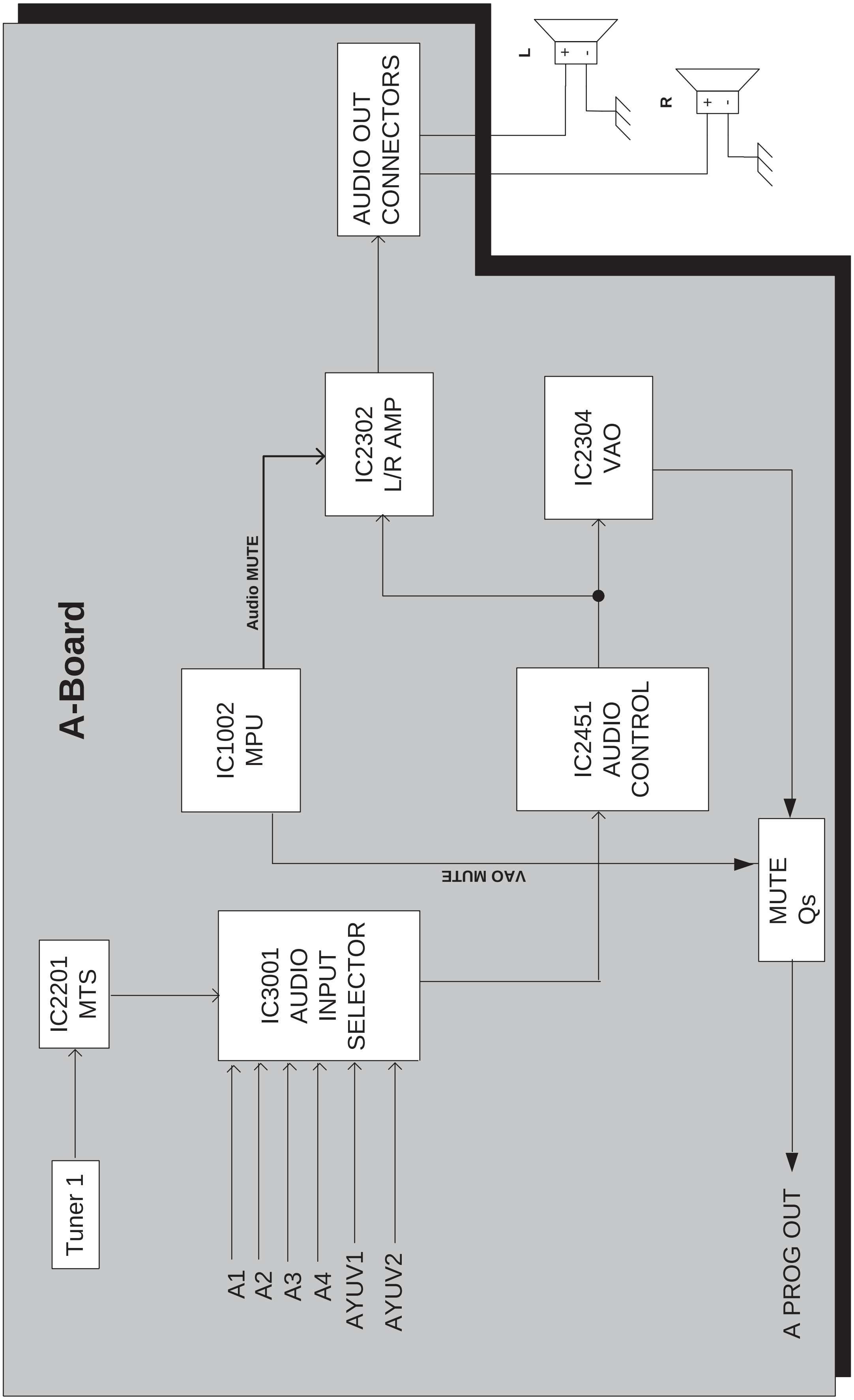

A-Board
Tuner 1
IC2201
MTS
IC3001
AUDIO
INPUT
SELECTOR
A1
A2
A3
A4
AYUV1
AYUV2
IC1002
MPU
Audio MUTE
VAO MUTE
IC2451
AUDIO
CONTROL
IC2302
L/R AMP
IC2304
VAO
MUTE
Qs
A PROG OUT
AUDIO OUT
CONNECTORS
L
R
+
-
+
-

Figure 65. **Audio signal path block diagram**

Video-chroma signal path block diagram

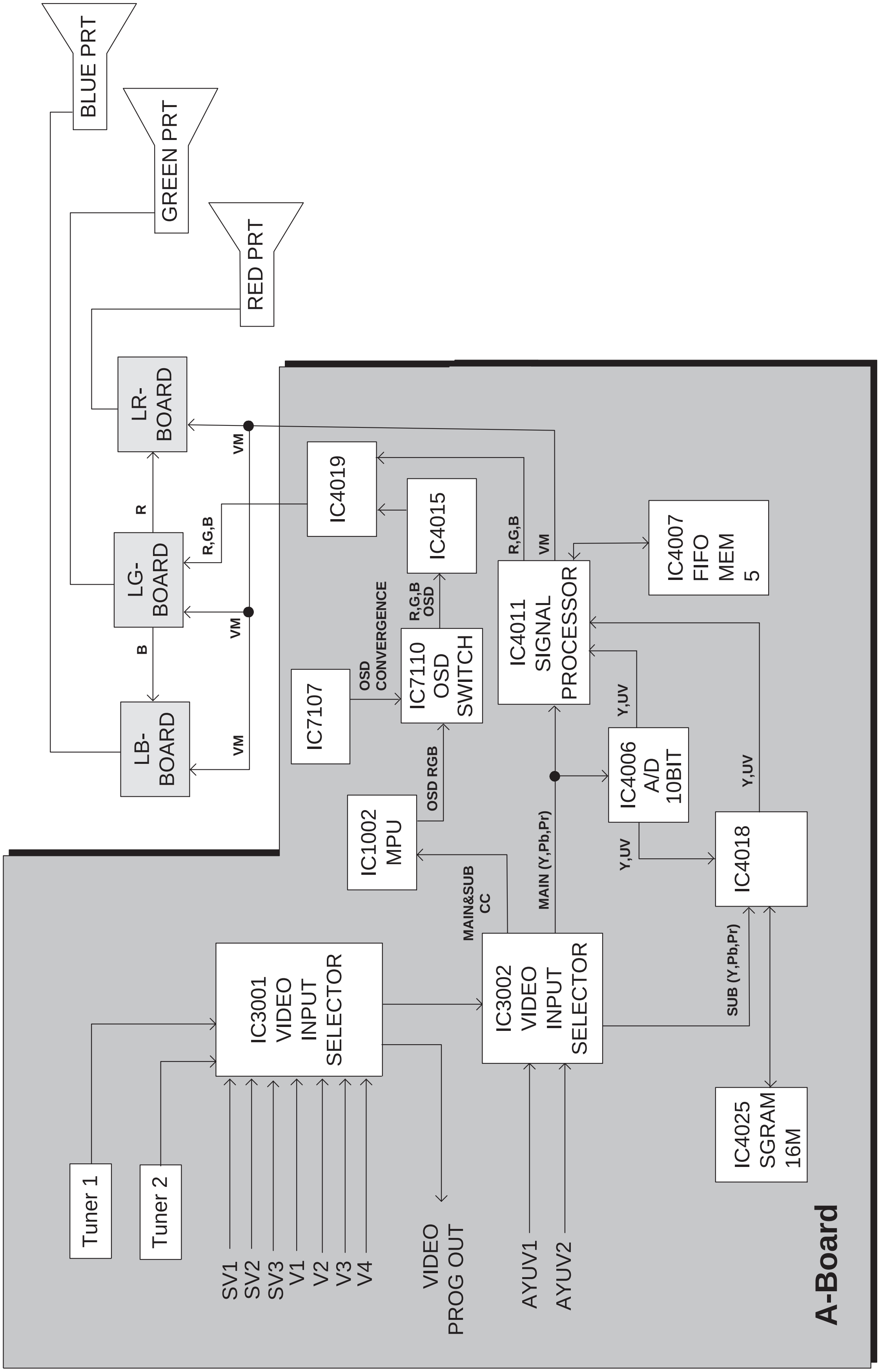

BLUE PRT
GREEN PRT
RED PRT
LR-BOARD
LG-BOARD
LB-BOARD
R
B
R,G,B
VM
VM
VM
IC4019
IC4015
R,G,B
VM
IC4007 FIFO MEM 5
IC4011 SIGNAL PROCESSOR
R,G,B OSD
OSD CONVERGENCE
IC7110 OSD SWITCH
IC7107
Y,UV
IC4006 A/D 10BIT
Y,UV
OSD RGB
IC1002 MPU
MAIN (Y,Pb,Pr)
Y,UV
IC4018
MAIN&SUB CC
SUB (Y,Pb,Pr)
IC3001 VIDEO INPUT SELECTOR
IC3002 VIDEO INPUT SELECTOR
IC4025 SGRAM 16M
Tuner 1
Tuner 2
SV1
SV2
SV3
V1
V2
V3
V4
VIDEO PROG OUT
AYUV1
AYUV2
A-Board

Figure 66. **Video-chroma signal path block diagram**.

IIC connection

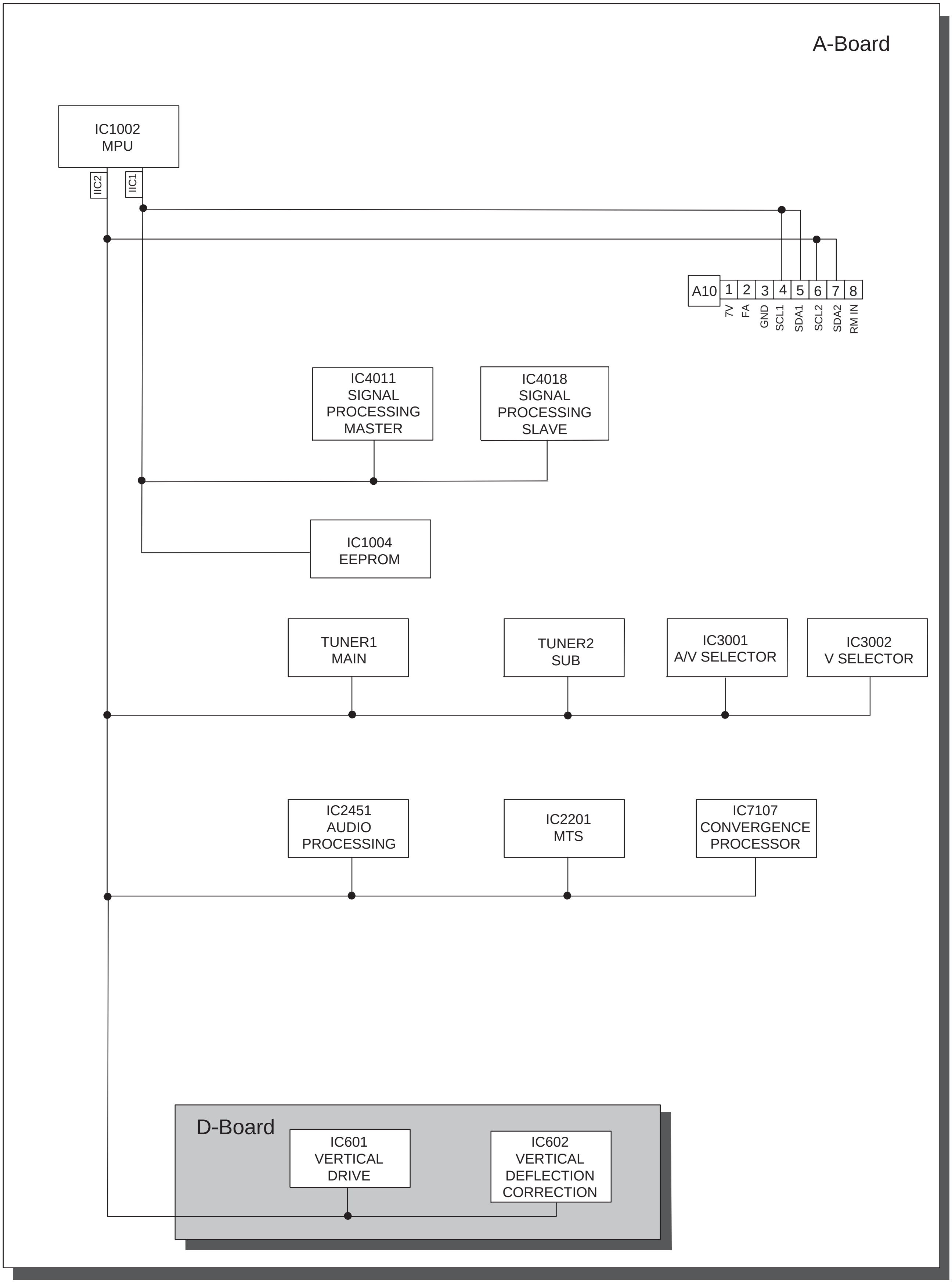

A-Board
IC1002
MPU
IIC2
IIC1
A10
1
2
3
4
5
6
7
8
7V
FA
GND
SCL1
SDA1
SCL2
SDA2
RM IN
IC4011
SIGNAL
PROCESSING
MASTER
IC4018
SIGNAL
PROCESSING
SLAVE
IC1004
EEPROM
TUNER1
MAIN
TUNER2
SUB
IC3001
A/V SELECTOR
IC3002
V SELECTOR
IC2451
AUDIO
PROCESSING
IC2201
MTS
IC7107
CONVERGENCE
PROCESSOR
D-Board
IC601
VERTICAL
DRIVE
IC602
VERTICAL
DEFLECTION
CORRECTION

Figure 67. **IIC connection**

Description of connectors

D4--A4

1	HHS DET
2	GND (CONV)
3	+18v
4	GND (CONV)
5	+18v
6	GND (CONV)
7	GND (CONV)
8	GND (REG)
9	-18v
10	GND (REG)
11	-18V
12	GND (REG)
13	GND (REG)
14	DAF
15	GND (REG)
16	DFCUT

D3--A3

1	BLK
2	9V
3	SDA
4	GND
5	SCL
6	GND
7	GND
8	GND
9	VP3
10	GND
11	V-PULS
12	GND
13	GND
14	GND
15	H-PULS
16	SET +5v

D6--HVD

1	STBY 7V
2	TO EHT SEPA. EHT REG GND
3	TO EHTSEPA. EHT CAPA GND
4	NC
5	TO EHT SEPA EHT F/B (R)
6	NC
7	STBY 7V

G1--A6

1	Y/V
2	NC
3	GND
4	C
5	S
6	L
7	GND
8	R
9	GND

D2--A2

1	GND
2	20V
3	GND
4	20V
5	GND
6	20V
7	GND
8	20V
9	GND
10	GND
11	GND
12	GND
13	ABL
14	GND
15	SOS
16	GND

D1--A1

1	+20V
2	GND (SOUND)
3	+20V
4	GND (SOUND)
5	-20V
6	GND (SOUND)
7	-20V
8	C-BTL 40V
9	AC ON/OFF
10	P_BTL 40V
11	STAND BY GND
12	STBY 7V
13	NC
14	NC
15	TUNER GND
16	TUNER GND

R1--A51

1	STB 3.3V
2	RM IN
3	GND

K3--A8

1	GND
2	KEY SCAN 1
3	KEY SCAN 2
4	TP
5	GND
6	LED

LR1--LG3

1	210V
2	NC
3	HEATER 6.3V
4	OFF MUTE
5	GND (SYGNAL)
6	R
7	12V
8	GND (PACHI)
9	S-ABL
10	18V
11	GND (VM)
12	VM
13	NC
14	140V

LB1--LG4

1	210V
2	NC
3	HEATER 6.3 V
4	OFF MUTE
5	GND (SYGNAL)
6	B
7	12V
8	GND (PACHI)
9	S-ABL
10	18V
11	GND (VM)
12	VM
13	NC
14	140V
15	NC

LG1--A15

1	GND
2	B
3	GND
4	R
5	GND
6	G
7	GND
8	GND
9	VM
10	GND (VM)
11	S-ABL
12	+12V

Description of connectors (continued)

LG2--D5	
1	210V
2	NC
3	GND
4	GND
5	+18V
6	+12V
7	HEATER
8	GND
9	NC
10	40V (+B OF VM)

A9--EEPROM	
1	NC
2	WP
3	GND
4	SCL
5	SDA
6	NC
7	NC

A10--BUSSCON	
1	STBY -7V
2	FA
3	GND
4	SCL1
5	SDA1
6	SCL2
7	SDA2
8	RM IN

REPLACEMENT PARTS LIST

Models: PT-47WX42F, PT-47WX42CF, PT-47WX52F, PT-47WX52CF

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
CAPACITORS		
C051	EEUFC1E470B	CAP,E 47UF-25V
C052	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C301	F2A2E100A026	CAP,E 10UF-250V
C302	ECCR1H221JC5	CAP,C 220PF-J-50V
C304	ECKW2H103PU8	CAP,C .01UF-P-500V
C305	F2A1H470A162	CAP,E 47UF-50V
C306	F2A2E100A026	CAP,E 10UF-250V
C307	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C310	F2A1H220A162	CAP,E 22UF-50V
C312	ECKC3D102KBN	CAP,C 1000PF-K-2KV
C313	ECKR2H102KB5	CAP,C 1000PF-K-500V
C331	F2A1H470A162	CAP,E 47UF-50V
C332	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C333	F2A1H470A162	CAP,E 47UF-50V
C334	F2A2E470A026	CAP,E 47UF-250V
C335	ECCR1H221JC5	CAP,C 220PF-J-50V
C336	F2A1H470A162	CAP,E 47UF-50V
C337	F2A2E470A026	CAP,E 47UF-250V
C339	ECKW2H103PU8	CAP,C .01UF-P-500V
C340	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C341	F2A2E100A026	CAP,E 10UF-250V
C342	F2A1H220A162	CAP,E 22UF-50V
C345	ECKC3D102KBN	CAP,C 1000PF-K-2KV
C346	ECKR2H102KB5	CAP,C 1000PF-K-500V
C361	F2A1C101A159	CAP,E 100UF-16V
C362	ECCR1H221JC5	CAP,C 220PF-J-50V
C364	ECKW2H103PU8	CAP,C .01UF-P-500V
C365	F2A2E100A026	CAP,E 10UF-250V
C366	F2A1H470A162	CAP,E 47UF-50V
C367	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C369	F2A1H470A162	CAP,E 47UF-50V
C372	ECKC3D102KBN	CAP,C 1000PF-K-2KV
C373	ECKR2H102KB5	CAP,C 1000PF-K-500V
C374	F2A1C101A159	CAP,E 100UF-16V
C405	F2A1E102A134	CAP,E 1000UF-25V
C406	F2A1E102A134	CAP,E 1000UF-25V
C407	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C408	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C411	TCJ2VB1H822K	CAP,C 8200PF-K-50V
C412	ECQB1224KF3	CAP,P .22UF-K-100V
C413	F2A1H1R0A162	CAP,E 1.0UF-50V
C414	TCJ2VB1H272K	CAP,C 2700PF-K-50V
C417	TCJ2VB1H103K	CAP,C .01UF-K-50V
C418	ECQB1H183JF3	CAP,P .018UF-J-50V
C421	ECEA1CN220UB	CAP,E 22UF-16V
C461	F2A1H221A162	CAP,E 220UF-50V
C501	F2A1V101A127	CAP,E 100UF-35V
C502	ECQV1H105JL3	CAP,P 1.0UF-J-50V
C503	ECKR2H102KB5	CAP,C 1000PF-K-500V
C509	ECWF2474JSR	CAP,P .47UF-J-200V
C511	**ECWH20222JVY**	**CAP,P 2200PF-J-2KV**
C512	**ECWH20102JVY**	**CAP,P 1000PF-J-2KV**
C513	**ECQF4103JZH**	**CAP,P .01UF-J-400V**
C514	**ECWH20222JVY**	**CAP,P 2200PF-J-2KV**
C518	**ECKW3D221JBP**	**CAP,C 220PF-J-2KVDC**
C519	**ECKW3D221JBP**	**CAP,C 220PF-J-2KVDC**
C520	**ECQB1H103JF3**	**CAP,P .01UF-J-50V**
C522	**ECWH20182JVY**	**CAP,P 1800PF-J-2KV**
C523	**ECWH20182JVY**	**CAP,P 1800PF-J-2KV**
C524	ECQB1224JF3	CAP,P .22UF-J-100V
C525	ECEA1HN220UB	CAP,E 22UF/50V
C526	F2A2E101A026	CAP,E 100UF-250V
C527	ECKR2H102KB5	CAP,C 1000PF-K-500V
C528	**F2A1H470A162**	**CAP,E 47UF-50V**
C531	ECA160V33UE	CAP,E 33UF/160V
C532	ECQB1H103JF3	CAP,P .01UF-J-50V
C533	ECKR2H101KB5	CAP,C 100UF-K-500V
C535	F2A1H471A162	CAP,E 470UF-50V
C601	EEUFC1C331B	CAP,E 330UF-16V
C602	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C603	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C605	F2A1H1R0A162	CAP,E 1.0UF-50V
C606	F2A1H1R0A162	CAP,E 1.0UF-50V
C608	ECQB1H103JF3	CAP,P .01UF-J-50V
C609	TCJ2VC1H820J	CAP,C 82PF-J-50V
C610	ECQB1H473JF3	CAP,P .047UF-J-50V
C611	ECQV1H105JL3	CAP,P 1.0UF-J-50V
C613	F2A1C221A159	CAP,E 220UF-16V
C614	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C616	ECQB1H104JF3	CAP,P .10UF-J-50V
C617	F2A1C221A159	CAP,E 220UF-16V
C618	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C619	ECJ2VC1H272J	CAP,C 2700PF-J-50V
C620	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C621	ECQB1H681JF3	CAP,P 680PF-J-50V
C622	TCJ2VC1H221J	CAP,C 220PF-J-50V
C623	ECQB1H473JF3	CAP,P .047UF-J-50V
C624	TCJ2VB1H152K	CAP,C 1500PF-K-50V
C625	TCJ2VC1H820J	CAP,C 82PF-J-50V
C627	ECQB1H183JF3	CAP,P .018UF-J-50V
C629	ECQV1H474JL3	CAP,P .47UF-J-50V
C631	ECSF1EE225VB	CAP,E 2.2UF-25V
C632	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C701	F2A1C221A159	CAP,E 220UF-16V
C702	ECKR3D271KBP	CAP,C 270PF-K-2KV
C703	ECQM2104KZW	CAP,P .1UF-K-200V
C704	ECKR2H391KB5	CAP,C 390PF-K-500V
C705	ECKR2H561KB5	CAP,C 560PF-K-500V
C707	TCJ2VF1H103Z	CAP,C .01UF-Z-50V

REPLACEMENT PARTS LIST

Models: PT-47WX42F, PT-47WX42CF, PT-47WX52F, PT-47WX52CF

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
C708	ECQE1685KFB	CAP,P 6.8UF-K-100V
C801	**ECQU2A104MNB**	**CAP,P .10UF-M-250VAC**
C802	**ECQU2A823MNB**	**CAP,P .082UF-M-250VAC**
C803	**ECKCNA222ME7**	**CAP,C 2200PF-M-125V**
C804	**ECKCNA222ME7**	**CAP,C 2200PF-M-125V**
C805	**ECKR2H472PU7**	**CAP,C 4700PF-P-500V**
C806	**ECKR2H472PU7**	**CAP,C 4700PF-P-500V**
C807	**ECKR2H472PU7**	**CAP,C 4700PF-P-500V**
C808	F2A1V101A127	CAP,E 100UF-35V
C809	TCJ2VB1E223K	CAP,C .022UF-K-25V
C810	**EETED2D102C**	**CAP,E 1000PF-200V**
C812	ECA1EHG471B	CAP,E 470UF-25V
C814	ECKW3D102KBP	CAP,C 1000PF-K-2KV
C815	ECQB1H152JF3	CAP,P 1500PF-J-50V
C816	ECKW3D821KBP	CAP,C 820PF-K-2KV
C817	ECKW3D102KBP	CAP,C 1000PF-K-2KV
C819	ECQB1H102JF3	CAP,P 1000PF-J-50V
C820	ECQV1H334JL3	CAP,P .33UF-J-50V
C821	ECQB1H272KF3	CAP,P 2700PF-K-50V
C822	F2A1H220A162	CAP,E 22UF-50V
C823	TCJ2VC1H151J	CAP,C 150PF-J-50V
C824	EEUFC1V151B	CAP,E 150UF-35V
C825	**ECKCNA102MBB**	**CAP,C .001UF-M-125V**
C826	TCJ2VB1E104K	CAP,C .1UF-K-25V
C830	**EETHC2C471B**	**CAP,E 470PF-160V**
C831	ECKR3D821KBP	CAP,C 820PF-K-2KV
C832	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C834	EEUFC1V222E	CAP,E 2200UF-35V
C836	ECKR3A331KBP	CAP,C 330PF-K-1KVDC
C837	F2A1E472A135	CAP,E 4700UF-25V
C838	F2A1E471A134	CAP,E 470UF-25V
C839	ECKR3A331KBP	CAP,C 330PF-K-1KVDC
C840	F2A1E471A134	CAP,E 470UF-25V
C841	F2A1E472A135	CAP,E 4700UF-25V
C842	ECKR3A331KBP	CAP,C 330PF-K-1KVDC
C843	F2A1V222A128	CAP,E 2200UF-35V
C844	ECKR3A331KBP	CAP,C 330PF-K-1KVDC
C845	F2A1V222A128	CAP,E 2200UF-35V
C846	ECKR3A331KBP	CAP,C 330PF-K-1KVDC
C848	F2A1C101A159	CAP,E 100UF-16V
C849	ECKR1H223ZF5	CAP,C .022UF-Z-50V
C851	ECQV1H104JL3	CAP,P .10UF-J-50V
C852	F2A1V101A127	CAP,E 100UF-35V
C854	F2A1C221A159	CAP,E 220UF-16V
C855	TCJ2VB1E104K	CAP,C .1UF-K-25V
C883	ECQV1H474JL3	CAP,P .47UF-J-50V
C890	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C897	ECQV1H474JL3	CAP,P .47UF-J-50V
C898	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C902	ECQM2103KZ3	CAP,P .01UF-K-200V

REF NO.	PART NO.	DESCRIPTION
C903	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C904	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C906	ECQM2103KZ3	CAP,P .01UF-K-200V
C907	F2A2C100A024	CAP,E 10UF-160V
C908	F2A1C101A159	CAP,E 100UF-16V
C909	F2A1C101A159	CAP,E 100UF-16V
C910	F2A2C100A024	CAP,E 10UF-160V
C912	F2A1H220A162	CAP,E 22UF-50V
C939	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C940	ECQM2103KZ3	CAP,P .01UF-K-200V
C941	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C942	ECQM2103KZ3	CAP,P .01UF-K-200V
C943	F2A2C100A024	CAP,E 10UF-160V
C944	F2A1C101A159	CAP,E 100UF-16V
C945	F2A1C101A159	CAP,E 100UF-16V
C947	F2A2C100A024	CAP,E 10UF-160V
C962	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C963	ECQM2103KZ3	CAP,P .01UF-K-200V
C965	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C966	ECQM2103KZ3	CAP,P .01UF-K-200V
C967	F2A2C100A024	CAP,E 10UF-160V
C968	F2A1C101A159	CAP,E 100UF-50V
C969	F2A1C101A159	CAP,E 100UF-16V
C970	F2A2C100A024	CAP,E 10UF-160V
C972	F2A1H470A162	CAP,E 47UF-50V
C1502	ECQE6104KFB	CAP,P 100UF-K-100V
C1503	ECQE6104KFB	CAP,P 100UF-K-100V
C1504	ECQB1H103JF3	CAP,P .01UF-J-50V
C1505	F2A1C221A159	CAP,E 220UF-16V
C1506	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1508	ECQB1H223JF3	CAP,P .022UF-J-50V
C1510	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1511	TCJ2VC1H471J	CAP,C 470PF-J-50V
C1512	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1513	ECEA1EN101UB	CAP,E 100UF-25V
C1514	F2A1C101A159	CAP,E 100UF-16V
	DIODES	
D081	LN21RCPHL	DIODE, LED
D082	MA4056MTA	DIODE
D083	MA4056MTA	DIODE
D301	MA167TA5	DIODE
D302	MA4150HTA	DIODE
D303	TVSRM1V1	DIODE
D304	MA165TA5VT	DIODE, SWITCHING
D306	MA165TA5VT	DIODE, SWITCHING
D307	MA165TA5VT	DIODE, SWITCHING
D312	MA188TA5	DIODE
D313	MA188TA5	DIODE
D314	MA188TA5	DIODE
D315	MA188TA5	DIODE

REPLACEMENT PARTS LIST

Models: PT-47WX42F, PT-47WX42CF, PT-47WX52F, PT-47WX52CF

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer’s specified parts.

REF NO.	PART NO.	DESCRIPTION
D331	MA165TA5VT	DIODE, SWITCHING
D334	MA165TA5VT	DIODE, SWITCHING
D335	MA165TA5VT	DIODE, SWITCHING
D339	MA188TA5	DIODE
D340	MA188TA5	DIODE
D341	MA188TA5	DIODE
D342	MA188TA5	DIODE
D361	MA165TA5VT	DIODE, SWITCHING
D363	MA165TA5VT	DIODE, SWITCHING
D364	MA165TA5VT	DIODE, SWITCHING
D369	MA188TA5	DIODE
D370	MA188TA5	DIODE
D371	MA188TA5	DIODE
D372	MA188TA5	DIODE
D407	MA152KTX	DIODE
D409	MA165TA5VT	DIODE, SWITCHING
D410	MA152KTX	DIODE
D411	MA165TA5VT	DIODE, SWITCHING
D451	AM01ZV0	DIODE
D452	AM01ZV0	DIODE
D453	AM01ZV0	DIODE
D454	AM01ZV0	DIODE
D455	AM01ZV0	DIODE
D456	AM01ZV0	DIODE
D458	ERA15-01V3	DIODE, RECTIFIER
D501	D1NL40V70	DIODE
D502	MA4150MTA	DIODE
D503	FMV-3GULF730	DIODE
D504	MA4270MTA	DIODE
D509	MA165TA5VT	DIODE, SWITCHING
D510	MA4068LTA	DIODE
D511	ERA18-04V3	DIODE
D512	**D1NL40V70**	**DIODE**
D513	MA165TA5VT	DIODE, SWITCHING
D515	D1NL40V70	DIODE
D516	EU2YXV0	DIODE
D519	AU02ZV0	DIODE
D634	MA165TA5VT	DIODE, SWITCHING
D650	MA4110MTA	DIODE, ZENER
D651	MA4110MTA	DIODE, ZENER
D656	MA4110MTA	DIODE, ZENER
D657	MA4110MTA	DIODE, ZENER
D659	MA4110MTA	DIODE, ZENER
D660	MA4110MTA	DIODE, ZENER
D662	MA4110MTA	DIODE, ZENER
D663	MA4110MTA	DIODE, ZENER
D702	D1NL40V70	DIODE
D801	**RBV-408**	**BRIDGE, RECTIFIER**
D802	**ERZC10VK361G**	**VARISTOR**
D815	MA165TA5VT	DIODE, SWITCHING

REF NO.	PART NO.	DESCRIPTION
D816	MA700TA	DIODE
D817	AU01ZV0	DIODE
D818	MA3270LTX	DIODE
D819	**TMPG10G3**	**DIODE**
D822	ERA22-02V3	DIODE
D825	**FMLG16SLF116**	**DIODE**
D827	RL4ZLF-J6	DIODE
D828	B0HBRM000012	DIODE
D829	B0HBRM000012	DIODE
D830	RL4ZLF-J6	DIODE
D831	RL4ZLF-J6	DIODE
D835	TVSA81004V3	DIODE
D837	MA152KTX	DIODE
D895	MA165TA5VT	DIODE, SWITCHING
D902	MA188TA5	DIODE
D933	MA188TA5	DIODE
D953	TVSSR2KNV	DIODE, ZENER
D962	MA188TA5	DIODE
D973	TVSSR2KNV	DIODE, ZENER
D983	TVSSR2KNV	DIODE, ZENER
D1502	RP1H	DIODE
D1503	**MA4030HTA**	**DIODE**
D1504	RP1H	DIODE
D1505	MA29-BTA	DIODE
D1506	**MA4051HTA**	**DIODE**
D1599	MA152KTX	DIODE
FUSES		
F801	**XBA1C63NU100**	**FUSE 6.3A/125V**
INTEGRATED CIRCUITS		
IC451	LA78045	VERTICAL OUT
IC601	C0ZAZ0000091	HORIZONTAL OUT
IC602	TA8859AP	V SAW
IC603	BA15218F-E2	OP AMP
IC701	AN6914	OP AMP
IC801	**AN8029**	**MAIN REG**
IC802	**SE139NLF4**	**ERROR AMP**
IC803	AN78L12TA	9V REGULATOR
IC804	TVSS1WBS20	DIODE, BRIDGE RECTIFIER
IC805	AN78M09LB	9V REGULATOR
IC811	**0N3171RLF**	**OPTO ISOLATOR**
IC871	SI-8050J	5V REGULATOR
IC872	SI-8090J	9V REGULATOR
IC873	C0DAAZG00006	2.5V REGULATOR
IC880	AN78N12LB	12V REGULATOR
IC1501	AN6562S-E1	OP AMP
IC2302	TDA7490	AUDIO AMP L/R
IC7001	STK392-110	CONVERGENCE AMP
IC7002	STK392-110	CONVERGENCE AMP
COILS		
L301	ELEBD101KA	COIL, PEAKING 100UH

REPLACEMENT PARTS LIST

Models: PT-47WX42F, PT-47WX42CF, PT-47WX52F, PT-47WX52CF

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REF NO.	PART NO.	DESCRIPTION
L302	ELESN100JA	COIL, PEAKING 10UH
L303	ELESN6R8JA	COIL, PEAKING 6.8UH
L304	ELESN4R7JA	COIL, PEAKING 4.7UH
L331	ELESN100JA	COIL, PEAKING 10UH
L332	ELESN6R8JA	COIL, PEAKING 6.8UH
L333	TLTABT560K	COIL
L334	ELESN4R7KA	COIL, PEAKING 4.7UH
L335	ELEBD101KA	COIL, PEAKING 100UH
L337	TLTABT560K	COIL
L361	ELEBD101KA	COIL, PEAKING 100UH
L362	ELESN100JA	COIL, PEAKING 10UH
L363	ELESN150JA	COIL, PEAKING 15UH
L364	ELESN4R7JA	COIL, PEAKING 4.7UH
L500	TALL08TR82MA	COIL
L501	EXCELSA35T	FERRITE BEAD
L510	EXCELDR25V	FERRITE BEAD
L511	EXCELDR25V	FERRITE BEAD
L515	EXCELDR25V	FERRITE BEAD
L516	EXCELDR25V	FERRITE BEAD
L555	ELH5L718	COIL
L607	TALL08T680KA	LINE FILTER
L701	ELESN100KA	COIL, PEAKING 10UH
L702	EXCELSA35T	FERRITE BEAD
L703	TALFP15B332K	COIL
L704	ELC18B151G	FILTER
L705	TALFP15B332K	COIL
L801	**ELF18D650M**	**CHOKE, AC LINE**
L802	**ELF21N035A**	**LINE FILTER**
L805	EXCELDR25V	FERRITE BEAD
L806	EXCELDR25V	FERRITE BEAD
L808	EXCELDR35V	FERRITE BEAD
L810	EXCELDR25V	FERRITE BEAD
L811	EXCELDR25V	FERRITE BEAD
L815	EXCELSA39E	FERRITE BEAD
L816	EXCELSA39E	FERRITE BEAD
L817	TALL08T680KA	LINE FILTER
L819	EXCELDR35V	FERRITE BEAD
L820	EXCELDR35V	FERRITE BEAD
L821	EXCELDR35V	FERRITE BEAD
L825	TALL08T330KA	LINE FILTER
L826	TALL08T330KA	LINE FILTER
L827	TALL08T330KA	LINE FILTER
L888	TALL08T680KA	LINE FILTER
L901	EXCELSA35T	FERRITE BEAD
L902	EXCELSA35T	FERRITE BEAD
L903	EXCELSA35T	FERRITE BEAD
L933	EXCELSA35T	FERRITE BEAD
L934	EXCELSA35T	FERRITE BEAD
L935	EXCELSA35T	FERRITE BEAD
L961	EXCELSA35T	FERRITE BEAD

REF NO.	PART NO.	DESCRIPTION
L962	EXCELSA35T	FERRITE BEAD
L963	EXCELSA35T	FERRITE BEAD
	TRANSISTORS	
Q301	2SC1473A	TRANSISTOR
Q302	2SC3526H	TRANSISTOR
Q303	2SC1473A	TRANSISTOR
Q331	2SC3526H	TRANSISTOR
Q353	2SC3942LB	TRANSISTOR
Q354	2SC3790E-RA	TRANSISTOR
Q355	2SA1480E-RA	TRANSISTOR
Q361	2SC3311ATA	TRANSISTOR
Q362	2SC3311ATA	TRANSISTOR
Q363	2SC3526H	TRANSISTOR
Q364	2SA1309ATA	TRANSISTOR
Q365	2SC3311ATA	TRANSISTOR
Q366	2SC3311ATA	TRANSISTOR
Q368	2SA1309ATA	TRANSISTOR
Q373	2SC3942LB	TRANSISTOR
Q374	2SC3790E-RA	TRANSISTOR
Q375	2SA1480E-RA	TRANSISTOR
Q393	2SC3942LB	TRANSISTOR
Q394	2SC3790E-RA	TRANSISTOR
Q395	2SA1480E-RA	TRANSISTOR
Q406	2SD601ARTX	TRANSISTOR
Q501	2SK2962TPE6	TRANSISTOR
Q502	2SK2847LBMAT	TRANSISTOR
Q503	2SD601ARTX	TRANSISTOR
Q509	2SC1473QR	TRANSISTOR
Q510	2SC1473QR	TRANSISTOR
Q551	2SC5612LB228	TRANSISTOR
Q601	2SD601ARTX	TRANSISTOR
Q602	2SD601ARTX	TRANSISTOR
Q603	2SD601ARTX	TRANSISTOR
Q604	2SD601ARTX	TRANSISTOR
Q605	2SB709ARTX	TRANSISTOR
Q606	2SD601ARTX	TRANSISTOR
Q701	2SK2538000LB	TRANSISTOR
Q801	2SK2917LB	TRANSISTOR
Q802	2SD601ARTX	TRANSISTOR
Q803	2SB709ARTX	TRANSISTOR
Q854	2SA19610QAHW	TRANSISTOR
Q901	2SA720ARTA	TRANSISTOR
Q903	2SA720TA	TRANSISTOR
Q904	2SC1318ARTA	TRANSISTOR
Q905	2SC1318ATA	TRANSISTOR
Q906	2SC1318ATA	TRANSISTOR
Q907	2SA720TA	TRANSISTOR
Q934	2SA720TA	TRANSISTOR
Q935	2SC1318ATA	TRANSISTOR
Q936	2SC1318ATA	TRANSISTOR

REPLACEMENT PARTS LIST

Models: PT-47WX42F, PT-47WX42CF, PT-47WX52F, PT-47WX52CF

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REF NO.	PART NO.	DESCRIPTION
Q937	2SA720TA	TRANSISTOR
Q938	2SA720ARTA	TRANSISTOR
Q941	2SC1318ARTA	TRANSISTOR
Q951	2SC3311ATA	TRANSISTOR
Q952	2SC3311ATA	TRANSISTOR
Q953	2SC3311ATA	TRANSISTOR
Q955	2SA1535ALB	TRANSISTOR
Q956	2SC3944ALB	TRANSISTOR
Q957	2SA1535ALB	TRANSISTOR
Q958	2SC3944ALB	TRANSISTOR
Q959	2SA1535ALB	TRANSISTOR
Q960	2SC3944ALB	TRANSISTOR
Q961	2SA720ARTA	TRANSISTOR
Q964	2SC1318ARTA	TRANSISTOR
Q965	2SA720TA	TRANSISTOR
Q966	2SC1318ATA	TRANSISTOR
Q967	2SC1318ATA	TRANSISTOR
Q968	2SA720TA	TRANSISTOR
Q1503	2SA1309ATA	TRANSISTOR
Q1504	2SC4635-YB7	TRANSISTOR
Q1505	2SC3311ATA	TRANSISTOR
RELAYS		
RL801	**K6B1ADA00010**	**RELAY**
RL802	**K6B1ADA00010**	**RELAY**
RESISTORS		
JS063	ERDS2TJ124T	RES,C 120K-J-1/4W
RM002	PNA4701M05TV	INT CKT
R013	ERG1SJ273P	RES,M 27K-J-1W
R015	ERG1SJ273P	RES,M 27K-J-1W
R072	ERDS2TJ101T	RES,C 100-J-1/4W
R073	ERDS2TJ471T	RES,C 470-J-1/4W
R080	ERDS2TJ222T	RES,C 2.2K-J-1/4W
R081	ERDS2TJ222T	RES,C 2.2K-J-1/4W
R082	ERDS2TJ332T	RES,C 3.3K-J-1/4W
R083	ERDS2TJ512T	RES,C 5.1K-J-1/4W
R084	ERDS2TJ912T	RES,C 9.1K-J-1/4W
R086	ERDS2TJ102T	RES,C 1K-J-1/4W
R087	ERDS2TJ331T	RES,C 330-J-1/4W
R301	ERDS1FJ394P	RES,C 390K-J-1/2W
R302	ERDS2TJ151T	RES,C 150-J-1/4W
R303	ER0S2THF2200	RES,M 220-F-1/4W
R304	ERDS2TJ334T	RES,C 330K-J-1/4W
R305	ER0S2THF2200	RES,M 220-F-1/4W
R306	ER0S2THF4700	RES,M 470-F-1/4W
R307	ERDS2TJ220T	RES,C 22-J-1/4W
R308	ERDS2TJ334T	RES,C 330K-J-1/4W
R310	ERDS2TJ183T	RES,C 18K-J-1/4W
R311	ERDS2TJ470T	RES,C 47-J-1/4W
R312	ERG7ZJ272	RES,M 2.7K-J-7W
R315	ERDS2TJ563T	RES,C 56K-J-1/4W

REF NO.	PART NO.	DESCRIPTION
R316	ERDS2TJ821T	RES,C 820-J-1/4W
R319	ERG12SJ101P	RES,M 100-J-1W
R320	ERDS1FJ330P	RES,C 33-J-1/2W
R321	ERDS1FJ330P	RES,C 33-J-1/2W
R322	ERG12SJ101P	RES,M 100-J-1W
R325	ERDS2TJ473T	RES,C 47K-J-1/4W
R327	ERC12GK331D	RES,C 330-K-1/2W
R328	ERDS1TJ104T	RES,C 100K-J-1/2W
R331	ER0S2THF2200	RES,M 220-F-1/4W
R332	ERDS2TJ151T	RES,C 150-J-1/4W
R333	ER0S2THF2200	RES,M 220-F-1/4W
R334	ERDS2TJ220T	RES,C 22-J-1/4W
R335	ER0S2THF4700	RES,M 470-F-1/4W
R345	ERDS2TJ470T	RES,C 47-J-1/4W
R347	ERG7ZJ272	RES,M 2.7K-J-7W
R348	ERDS2TJ563T	RES,C 56K-J-1/4W
R349	ERDS2TJ821T	RES,C 820-J-1/4W
R350	ERG12SJ101P	RES,M 100-J-1W
R351	ERDS1FJ330P	RES,C 33-J-1/2W
R352	ERDS1FJ330P	RES,C 33-J-1/2W
R353	ERG12SJ101P	RES,M 100-J-1W
R354	ERDS2TJ473T	RES,C 47K-J-1/4W
R356	ERC12GK331D	RES,C 330-K-1/2W
R357	ERDS1TJ104T	RES,C 100K-J-1/2W
R361	ER0S2THF1302	RES,M 13K-F-1/4W
R362	ER0S2THF1002	RES,M 10K-F-1/4W
R363	ERDS2TJ220T	RES,C 22-J-1/4W
R364	ERDS2TJ102T	RES,C 1K-J-1/4W
R365	ERDS2TJ221T	RES,C 220-J-1/4W
R366	ERDS2TJ151T	RES,C 150-J-1/4W
R367	ER0S2THF2200	RES,M 220-F-1/4W
R368	ER0S2THF2200	RES,M 220-F-1/4W
R369	ERDS2TJ472T	RES,C 4.7K-J-1/4
R372	ER0S2THF82R0	RES,M 82.0-F-1/4W
R375	ERDS2TJ470T	RES,C 47-J-1/4W
R376	ERG7ZJ272	RES,M 2.7K-J-7W
R379	ERDS2TJ563T	RES,C 56K-J-1/4W
R380	ERDS2TJ821T	RES,C 820-J-1/4W
R383	ERG12SJ101P	RES,M 100-J-1W
R384	ERDS1FJ330P	RES,C 33-J-1/2W
R385	ERDS1FJ330P	RES,C 33-J-1/2W
R386	ERG12SJ101P	RES,M 100-J-1W
R389	ERDS2TJ473T	RES,C 47K-J-1/4W
R390	ERC12GK331D	RES,C 330-K-1/2W
R391	ERDS1TJ104T	RES,C 100K-J-1/2W
R392	ER0S2THF8201	RES,M 8.2K-F-1/4W
R393	ER0S2THF8201	RES,M 8.2K-F-1/4W
R394	ERDS2TJ102T	RES,C 1K-J-1/4W
R395	ERDS2TJ221T	RES,C 220-J-1/4W
R396	ERDS2TJ472T	RES,C 4.7K-J-1/4

REPLACEMENT PARTS LIST

Models: PT-47WX42F, PT-47WX42CF, PT-47WX52F, PT-47WX52CF

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REF NO.	PART NO.	DESCRIPTION
R397	ER0S2THF1201	RES,M 1.2K-F-1/4W
R398	ER0S2THF3300	RES,M 330-F-1/4W
R408	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W
R409	ERDS2TJ563T	RES,C 56K-J-1/4W
R410	ERJ6GEYJ224V	RES,M 220K-J-1/10W
R411	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R412	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W
R415	ERG3FJ331H	RES,M 330-J-3W
R421	ERJ6GEYJ273V	RES,M 27K-J-1/10W
R422	ERJ6GEYJ101V	RES,M 100-J-1/10W
R423	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R425	ERDS1FJ1R0P	RES,C 1.0-J-1/2W
R426	ERJ6GEYJ153V	RES,M 15K-J-1/10W
R428	ERJ6GEYJ123V	RES,M 12K-J-1/10W
R434	ERX12SJ1R8P	RES,M 1.8-J-1/2W
R435	ERX12SJ1R8P	RES,M 1.8-J-1/2W
R465	ERDS2TJ392T	RES,C 3.9K-J-1/4W
R466	ERDS2TJ562T	RES,C 5.6K-J-1/4W
R470	ERDS2TJ331T	RES,C 330-J-1/4W
R471	ERDS2TJ331T	RES,C 330-J-1/4W
R472	ERDS2TJ331T	RES,C 330-J-1/4W
R501	ERDS2TJ104T	RES,C 100K-J-1/4W
R502	ERDS2TJ680T	RES,C 68-J-1/4W
R503	ERG2FJ180H	RES,M 18-J-2W
R504	ERG3FJ271H	RES,M 270-J-3W
R505	ERG1SJ120P	RES,M 12-J-1W
R506	ERX1SJR47P	RES,M .47-J-1W
R513	ERDS2TJ471T	RES,C 470-J-1/4W
R514	ER0S2THF3322	RES,M 33.2K-F-1/4W
R515	ER0S2THF4702	RES,M 47K-F-1/4W
R516	ERJ6GEYJ101V	RES,M 100-J-1/10W
R517	ERDS2TJ103T	RES,C 10K-J-1/4W
R518	ERX12SJR22V	RES,M .22-J-1/2
R519	ERQ12HKR22P	RES,F .22-K-1/2W
R520	**ERQ12HJ330P**	**RES,F 33-J-1/2W**
R521	**ER0S2THF2612**	**RES,M 26.1K-F-1/4W**
R522	**ER0S2THF7151**	**RES,M 7.15K-F-1/4W**
R523	ERDS2TJ275T	RES,C 2.7MEG-J-1/4W
R524	EVM38GA00B54	CONTROL 5K
R525	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R534	ERDS2TJ224T	RES,C 220K-J-1/4W
R535	ERDS2TJ272T	RES,C 2.7K-J-1/4W
R536	ERDS2TJ101T	RES,C 100-J-1/4W
R537	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W
R538	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R539	ERDS2TJ393T	RES,C 39K-J-1/4W
R541	ERDS2TJ563T	RES,C 56K-J-1/4W
R550	ERDS2TJ273T	RES,C 27K-J-1/4W
R601	ERJ6GEYJ101V	RES,M 100-J-1/10W
R602	ERJ6GEYJ101V	RES,M 100-J-1/10W
R603	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R604	ERJ6GEYJ101V	RES,M 100-J-1/10W
R605	ERJ6GEYJ101V	RES,M 100-J-1/10W
R606	ERJ6GEYJ101V	RES,M 100-J-1/10W
R607	ER0S2THF6201	RES,M 6.2K-F-1/4W
R608	ERJ6ENF3830V	RES,M 383-F-1/10W
R609	ERJ6GEYJ183V	RES,M 18K-J-1/10W
R610	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R611	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R612	ERDS2TJ332T	RES,C 3.3K-J-1/4W
R613	ERDS2TJ561T	RES,C 560-J-1/4W
R614	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R615	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W
R616	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W
R617	ERJ6GEYJ123V	RES,M 12K-J-1/10W
R618	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W
R619	ERDS2TJ331T	RES,C 330-J-1/4W
R620	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R621	ERJ6GEYJ153V	RES,M 15K-J-1/10W
R622	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R623	ERJ6GEYJ123V	RES,M 12K-J-1/10W
R624	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W
R625	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R626	ERG1SJ122P	RES,M 1.2K-J-1W
R627	ERDS2TJ332T	RES,C 3.3K-J-1/4W
R628	ERDS2TJ391T	RES,C 390-J-1/4W
R629	ERJ6GEYJ100V	RES,M 10-J-1/10W
R630	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R631	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R632	ERJ6GEYJ331V	RES,M 330-J-1/10W
R633	ERJ6GEYJ182V	RES,M 1.8K-J-1/10W
R634	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R635	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W
R636	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R637	ERDS2TJ101T	RES,C 100-J-1/4W
R638	ERDS2TJ101T	RES,C 100-J-1/4W
R642	ERDS2TJ101T	RES,C 100-J-1/4W
R643	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R644	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R645	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W
R653	ERDS2TJ101T	RES,C 100-J-1/4W
R654	ERDS2TJ184T	RES,C 180K-J-1/4W
R655	ERDS2TJ184T	RES,C 180K-J-1/4W
R704	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W
R706	ERDS1FJ680T	RES,C 68-J-1/2W
R707	ERG2FJ222H	RES,M 2.2K-J-2W
R708	ERF5AK4R7H	RES,W 4.7-K-5W
R709	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R800	**ERU5TCK1R5T**	**RES,F 1.5-K-5W**
R805	ERDS2TJ101T	RES,C 100-J-1/4W

REPLACEMENT PARTS LIST

Models: PT-47WX42F, PT-47WX42CF, PT-47WX52F, PT-47WX52CF

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R808	ERX12SZJR12P	RES,M .12-J-1/2W
R809	ERJ6GEYJ225V	RES,M 2.2M-J-1/10W
R810	ERX12SZJR12P	RES,M .12-J-1/2W
R811	ERX12SZJR12P	RES,M .12-J-1/2W
R812	ERDS2TJ103T	RES,C 10K-J-1/4W
R813	ERDS1FJ561T	RES,C 560-J-1/2
R814	ERDS2TJ4R7T	RES,C 4.7-J-1/4W
R815	ERJ6GEYJ471V	RES,M 470-J-1/10W
R816	ERDS2TJ471T	RES,C 470-J-1/4W
R817	ERJ6ENF2001V	RES,M 2K-F-1/10W
R818	ERDS1FJ100T	RES,C 10-J-1/2W
R820	ERDS1FJ470T	RES,C 47-J-1/2W
R822	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R832	**ERD75TAJ825**	**RES,C 8.2MEG-J-3/4W**
R833	ERJ6GEYJ101V	RES,M 100-J-1/10W
R835	ERDS2TJ101T	RES,C 100-J-1/4W
R836	ERJ6GEYJ101V	RES,M 100-J-1/10W
R839	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R840	ERJ6GEYJ101V	RES,M 100-J-1/10W
R846	ERDS2TJ223T	RES,C 22K-J-1/4W
R847	ERDS2TJ272T	RES,C 2.7K-J-1/4W
R857	ERX1SJ1R0P	RES,M 1.0-J-1W
R858	ERX1SJ1R0P	RES,M 1.0-J-1W
R859	ERDS2TJ103T	RES,C 10K-J-1/4W
R860	ERDS1FJ222T	RES,C 2200-J-1/2W
R862	ERG3FJ333H	RES,M 33K-J-3W
R865	ERJ6GEYJ153V	RES,M 15K-J-1/10W
R866	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W
R867	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R880	TSF39402	FUSE 4.0A/125V
R881	TSF39402	FUSE 4.0A/125V
R895	ERDS2TJ100T	RES,C 10-J-1/4W
R896	ERDS1FJ820T	RES,C 82-J-1/2W
R901	ERDS2FJ122T	RES,C 1.2K-J-1/2W
R902	ERDS2TJ103T	RES,C 10K-J-1/4W
R903	ERDS2TJ683T	RES,C 68K-J-1/4W
R904	ERDS2TJ683T	RES,C 68K-J-1/4W
R905	ERDS2TJ103T	RES,C 10K-J-1/4W
R906	ERDS2TJ122T	RES,C 1.2K-J-1/4W
R907	ERDS1FVJ390T	RES,C 39-J-1/2W
R908	ERDS1FVJ390T	RES,C 39-J-1/2W
R909	ERDS1FVJ8R2T	RES,C 8.2-J-1/2W
R910	ERDS2TJ8R2T	RES,C 8.2-J-1/4W
R911	ERG3SJS221H	RES,M 220-J-3W
R912	ERDS2TJ681T	RES,C 680-J-1/4W
R913	ERDS1FVJ152T	RES,C 1.5K-J-1/2W
R914	ERDS1FVJ152T	RES,C 1.5K-J-1/2W
R915	ERQ14AJ220P	RES,F 22-J-1/4W
R916	ERQ14AJ220P	RES,F 22-J-1/4W
R917	ERQ14AJ100P	RES,F 10-J-1/4W

REF NO.	PART NO.	DESCRIPTION
R925	ERDS2TJ221T	RES,C 220-J-1/4W
R926	ERDS2TJ221T	RES,C 220-J-1/4W
R928	ERQ14AJ220P	RES,F 22-J-1/4W
R929	ERDS2TJ101T	RES,C 100-J-1/4W
R942	ERDS1FVJ152T	RES,C 1.5K-J-1/2W
R943	ERDS1FVJ152T	RES,C 1.5K-J-1/2W
R944	ERDS2TJ471T	RES,C 470-J-1/4W
R945	ERDS2TJ471T	RES,C 470-J-1/4W
R946	ERQ14AJ100P	RES,F 10-J-1/4W
R947	ERQ14AJ220P	RES,F 22-J-1/4W
R948	ERDS2FJ122T	RES,C 1.2K-J-1/2W
R949	ERDS2TJ103T	RES,C 10K-J-1/4W
R950	ERDS2TJ683T	RES,C 68K-J-1/4W
R951	ERDS2TJ683T	RES,C 68K-J-1/4W
R952	ERDS2TJ103T	RES,C 10K-J-1/4W
R953	ERDS2TJ122T	RES,C 1.2K-J-1/4W
R954	ERDS1FVJ390T	RES,C 39-J-1/2W
R955	ERDS1FVJ390T	RES,C 39-J-1/2W
R956	ERDS1FVJ8R2T	RES,C 8.2-J-1/2W
R957	ERDS2TJ8R2T	RES,C 8.2-J-1/4W
R958	ERG3SJS221H	RES,M 220-J-3W
R959	ERDS2TJ471T	RES,C 470-J-1/4W
R961	ERDS2FJ122T	RES,C 1.2K-J-1/2W
R962	ERDS2TJ103T	RES,C 10K-J-1/4W
R963	ERDS2TJ683T	RES,C 68K-J-1/4W
R964	ERDS2TJ683T	RES,C 68K-J-1/4W
R965	ERDS2TJ103T	RES,C 10K-J-1/4W
R966	ERDS2TJ122T	RES,C 1.2K-J-1/4W
R967	ERDS1FVJ390T	RES,C 39-J-1/2W
R968	ERDS1FVJ390T	RES,C 39-J-1/2W
R969	ERDS1FVJ8R2T	RES,C 8.2-J-1/2W
R970	ERDS2TJ8R2T	RES,C 8.2-J-1/4W
R971	ERG3SJS221H	RES,M 220-J-3W
R972	ERDS2TJ101T	RES,C 100-J-1/4W
R973	ERDS1FVJ152T	RES,C 1.5K-J-1/2W
R974	ERDS1FVJ152T	RES,C 1.5K-J-1/2W
R975	ERQ14AJ100P	RES,F 10-J-1/4W
R976	ERQ14AJ220P	RES,F 22-J-1/4W
R978	ERQ14AJ220P	RES,F 22-J-1/4W
R1501	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R1503	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R1504	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R1505	ERDS2TJ102T	RES,C 1K-J-1/4W
R1506	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W
R1507	ERG3SJD222L	RES,M 2200-J-3W
R1508	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W
R1510	ERG2SJD273L	RES,M 27K-J-2W
R1511	ERG2SJD273L	RES,M 27K-J-2W
R1512	ERJ6ENF1501V	RES,M 1.5K-F-1/10W
R1514	ERG2SJD273L	RES,M 27K-J-2W

REPLACEMENT PARTS LIST

Models: PT-47WX42F, PT-47WX42CF, PT-47WX52F, PT-47WX52CF

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R1515	ERJ6ENF1001V	RES,M 1K-F-1/10W
R1516	ERJ6GEYJ101V	RES,M 100-J-1/10W
R1517	ERJ6ENF3571V	RES,M 3.57K-F-1/10W
R1518	ERG2SJD273L	RES,M 27K-J-2W
R1519	ERDS2TJ101T	RES,C 100-J-1/4W
R1520	ERDS2TJ221T	RES,C 220-J-1/4W
R1521	ER0S2THF5100	RES,M 510-F-1/4W
R1522	ERC12GK103D	RES,C 10K-K-1/2W
R1523	ERDS2TJ104T	RES,C 100K-J-1/4W
R1524	ER0S2THF9100	RES,M 910-F-1/4W
R1526	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R1527	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W
R1528	ERDS2TJ332T	RES,C 3.3K-J-1/4W
R1529	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R1542	ERG2SJD273L	RES,M 27K-J-2W
R1544	ERJ6GEYJ471V	RES,M 470-J-1/10W
R1546	ERJ6GEYJ221V	RES,M 220-J-1/10W
R1599	ERJ6ENF9761V	RES,M 9760-F-1/10W
SWITCHES		
S010	SKHHDTA010	SWITCH
S011	SKHHDTA010	SWITCH
S012	SKHHDTA010	SWITCH
S013	SKHHDTA010	SWITCH
S014	SKHHDTA010	SWITCH
S015	SKHHDTA010	SWITCH
S016	SKHHDTA010	SWITCH
TRANSFORMERS		
T501	ETH19K186AM	TRANSFORMER
T551	**KFT7AA334F**	**TRANSFORMER, FLYBACK**
T801	**ETS39AG2U5BC**	**TRANSFORMER, SWITCHING**
T802	**ETP30KB941JG**	**TRANSFORMER**
CRYSTALS/FILTERS		
X601	TAFCSB503F30	CRYSTAL
OTHERS		
TNR001	**ENG36602GS**	**TUNER**
TNR002	**ENG36603GR**	**TUNER**
M001	**TSX2AA0291**	**A/C LINE CORD W/FILTER**
M002	**TXFCRT14FSER**	**ASSY, CRT (B)**
M003	**TXFCRT15FSER**	**ASSY, CRT (G)**
M004	**TXFCRT16FSER**	**ASSY, CRT (R)**
M005	**TJSC00700**	**CRT SOCKET**
DY	**KDY2ASC29F**	**YOKE, DEFLECTION**
M006	TXF3A01ECV	ASSY, DAG GND
M007	TKG2AF020	A/B LENS
M008	TKG2AA50091	MIRROR, GLASS
M009	TKG2AD00071	SCREEN PANEL, PROTECTIVE *PT-47WX52F/CF*
M010	TKG2AH50471	SCREEN, FRESNEL
M011	TKG2AH50461	SCREEN, LENTICULAR
M012	TXFLB01FSER	ASSY, ADJUSTED LIGHT BOX
M013	TMK2AX00305	SHEET, LIGHT COVER

REF NO.	PART NO.	DESCRIPTION
M014	TNXB003	FOCUS BLOCK
M015	TKU2AC2201S	CABINET BACK
M016	TKY2AA3003S	CABINET FRONT *PT-47WX52F/CF*
M017	TKY2AA3005S	CABINET FRONT *PT-47WX42F/CF*
M018	TAS2AA0026	SPEAKER 15 WATT *PT-47WX42F/CF*
M019	TAS2AA0027	SPEAKER WOOFER *PT-47WX52F/CF*
M020	TAS2AA0022	SPEAKER TWEETER *PT-47WX52F/CF*
M021	ENPE2A001	SPLITTER 2RF (U-LIM)
M022	KFT7CP336F	TRANSFORMER DISTRIBUTOR
M023	TBL2AH30071	CASTER
M024	TBM2AA0012	BADGE, PANASONIC
M025	TBX2AA0161G	BUTTON, 7-KEY
M026	TKD2AX0621	INNER BARRIER BOARD
M027	TKP2AA0584S	BRACKET, REAR
M028	TKU2AA02701A	CABINET BACK, LOWER
M029	TKB2AA0172S	ASSY, CABINET WOOD *PT-47WX42F/CF*
M030	TKB2AA0173S	ASSY, CABINET WOOD PTV *PT-47WX52F/CF*
M031	TKP2AA0649S	ASSY, CONTROL PANEL *PT-47WX52F/CF*
M032	TKP2AA06491S	ASSY, CONTROL PANEL *PT-47WX42F/CF*
M033	TKP2AA0622S	ASSY, SPEAKER GRILLE *PT-47WX42F/CF*
M034	TKP2AA0626S	ASSY, SPEAKER GRILLE *PT-47WX52F/CF*
M035	TKP2AA0681	LED PANEL
JK1001	TJB2A10013	TERMINAL, A/V (FRONT)
JK3001	TJB2AA0311	TERMINAL, A/V (REAR)
ACCESORIES		
M036	EUR7613Z40	REMOTE CONTROL *PT-47WX42F/CF*
M037	EUR7603Z30	REMOTE CONTROL *PT-47WX52F/CF*
M038	UR76EC0303A	BATTERY COVER, REMOTE CONTROL
M039	TXANV05ESER	BRKT. MIRROR, SIDE
M040	TXANV06ESER	BRKT. MIRROR, TOP
M041	TXANV10ESER	SCREEN BRACKET
M042	TQB2AA0420	MANUAL, OWNERS *PT-47WX42F, PT-47WX52F*
M043	TQB2AA0421	MANUAL, OWNERS *PT-47WX52CF, PT-47WX42CF*

DESCRIPTION OF ABBREVIATIONS GUIDE

RESISTOR			
TYPE		TOLERANCE	
C	Carbon	F	± 1%
F	Fuse	J	± 5%
M	Metal Oxide	K	± 10%
S	Solid	M	± 20%
W	Wire Wound	G	± 2%

RES, C 270-J-1/4

CAPACITOR			
TYPE		TOLERANCE	
C	Ceramic	C	± 0.25pF
E	Electrolytic	D	± 0.5pF
P	Polyester	F	± 1pF
S	Styrol	J	± 5%
T	Tantalum	K	± 10%
		L	± 15%
		M	± 20%
		P	+10% -0%
		Z	+80% -20%

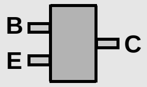
CAP, P .068UF-K-50V

Notes:

IMPORTANT SAFETY NOTICE

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A ⚠ IN THE SCHEMATIC.

CHIP TRANSISTOR LEAD DESIGNATION



SCHEMATIC NOTES

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
3. Coil value notes is inductance in µH.
4. Test point indicated by ●; Test point but no pin ○.
5. Components indicated with ⚠ are critical parts and replacement should be made with manufacture specified replacement parts only.
6. ▬ (**BOLD LINE**) indicates the route of B+ supply.
7. The schematic diagrams are current at the time of printing and are subject to change without notice.
8. Ground symbol ⏚ indicates **HOT GROUND CONNECTION**; ⊥ indicates COLD GROUND.

NOTE: All other component symbols are used for engineering design purposes.

VOLTAGE MEASUREMENTS

1. Voltage measurement:
   - AC input to the Receiver is 120V. NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
   - All Picture and Audio adjustments are set to Normalize.
     TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
     Volume - Min.
     TV/Video SW - TV position
     Audio Mode - Stereo
   - Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content.
   - Supply voltages are nominal.
2. Ground symbol ⏚ indicates ground lead connection of meter.
   Incorrect ground connection will result in erroneous readings.

CAUTION: ***Incorrect ground connection of the test equipment will result in erroneous readings.***

WAVEFORM MEASUREMENTS

1. ③ indicates waveform measurement. (Measurement can be taken at the best accessible location in common to the indicated point.)
2. Taken with an NTSC signal generator connected to the antenna terminal. (NTSC color bar pattern of 8 bars of EIA colors, 100 IRE white and 7.5 IRE black.)
3. Customer Controls (Picture/Audio Menu) are set to Normalize. Volume is set to “MIN”.
4. All video and color waveforms are taken with a wideband scope and a probe with low capacitance (10 to 1). Shape and peak altitudes may vary depending on the type of Oscilloscope used and its settings.
5. Ground symbol ⏚ shown on waveform number indicates (Hot) ground lead connection of the Oscilloscope.

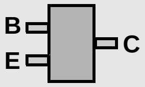
CAUTION: Incorrect ground connection of the test equipment will result in erroneous readings.

Notes

NOTA DE SEGURIDAD

LOS DIAGRAMAS ELÉCTRICOS INCLUYEN CARACTERÍSTICAS ESPECIALES MUY IMPORTANTES PARA LA PROTECCIÓN CONTRA RAYOS-X, QUEMADURAS Y DESCARGAS ELÉCTRICAS. CUANDO SE DE SERVICIO ES IMPORTANTE USAR PARA REEMPLAZO DE COMPONENTES CRITICOS, SOLO PARTES ESPECIFICADAS POR EL FABRICANTES. LOS COMPONENTES CRITICOS ESTAN SEÑALADOS EN LOS DIAGRAMAS POR EL SIMBOLO ⚠.

IDENTIFICACIÓN DE TERMINALES PARA TRANSISTORES EN *CHIP*



NOTAS DE LOS DIAGRAMAS

1. Las Resistencias son de Carbón de 1/4W, a menos que se indique otra característica.
2. Los Capacitores son de Cerámica para 50V, a menos que se indique otra característica.
3. El valor indicado de las Bobinas es la inductancia expresada en µH.
4. Los puntos de prueba en la terminal de algún componente son indicados por ⫯ Los puntos de prueba fuera de los componentes se indican con ⫯.
5. Los componentes señalados con el símbolo ⚠ son considerados componentes críticos y deben ser reemplazados sólo con las partes especificadas por el fabricante.
6. ▬ (**LINEA GRUESA**) indica las líneas de alimentación de los Voltajes B+.
7. Los diagramas eléctricos están sujetos a cambio sin previo aviso.
8. El símbolo ⏚ indica que es una conexión a **Tierra Caliente** y el símbolo ⏚ indica conexión a **Tierra Fría**.

***NOTA:** Los demas símbolos de componentes incluidos son usados con fines de diseño.*

MEDICIÓN DE VOLTAJES

1. Medición de voltaje:
   - El voltaje de entrada al Receptor es de 120V de Corriente Alterna. Un generador de patrones con formato NTSC se conecta a la entrada de la antena. (Patrón de Barras de Colores con 100 IREs para el Blanco y 7.5 IREs para el Negro.)
   - Los ajustes de los Menus Picture y Audio se normalizan.
     En el Menú Set-Up, en la opción ANTENA, se selecciona el modo de CABLE.
     El nivel de Volumen se minimiza.
     De los modos TV y Video, seleccionar el modo TV.
     Seleccionar modo Estereo del Audio.
   - Las mediciones de los voltajes son nominales y pueden variar hasta 10% en componentes en funcionamiento. Las lecturas de los voltajes pueden variar por la potencia de la señal y el contenido de la imagen.
   - Las fuentes de voltajes son nominales.
2. El símbolo ⏚ indica el tipo de tierra que se utiliza en la conexión del medidor.

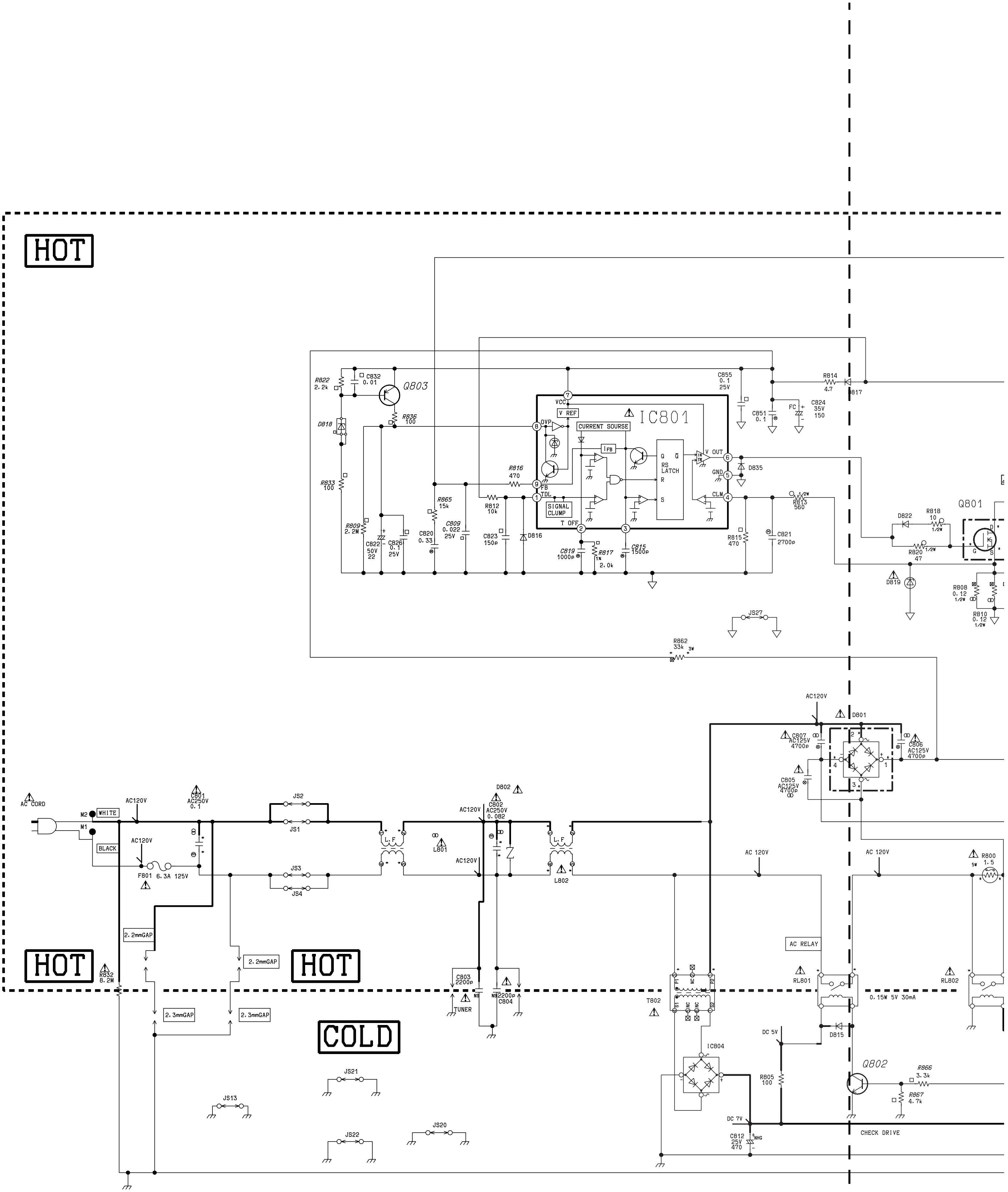
PRECAUCION: SI no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

MEDICIÓN DE FORMAS DE ONDA

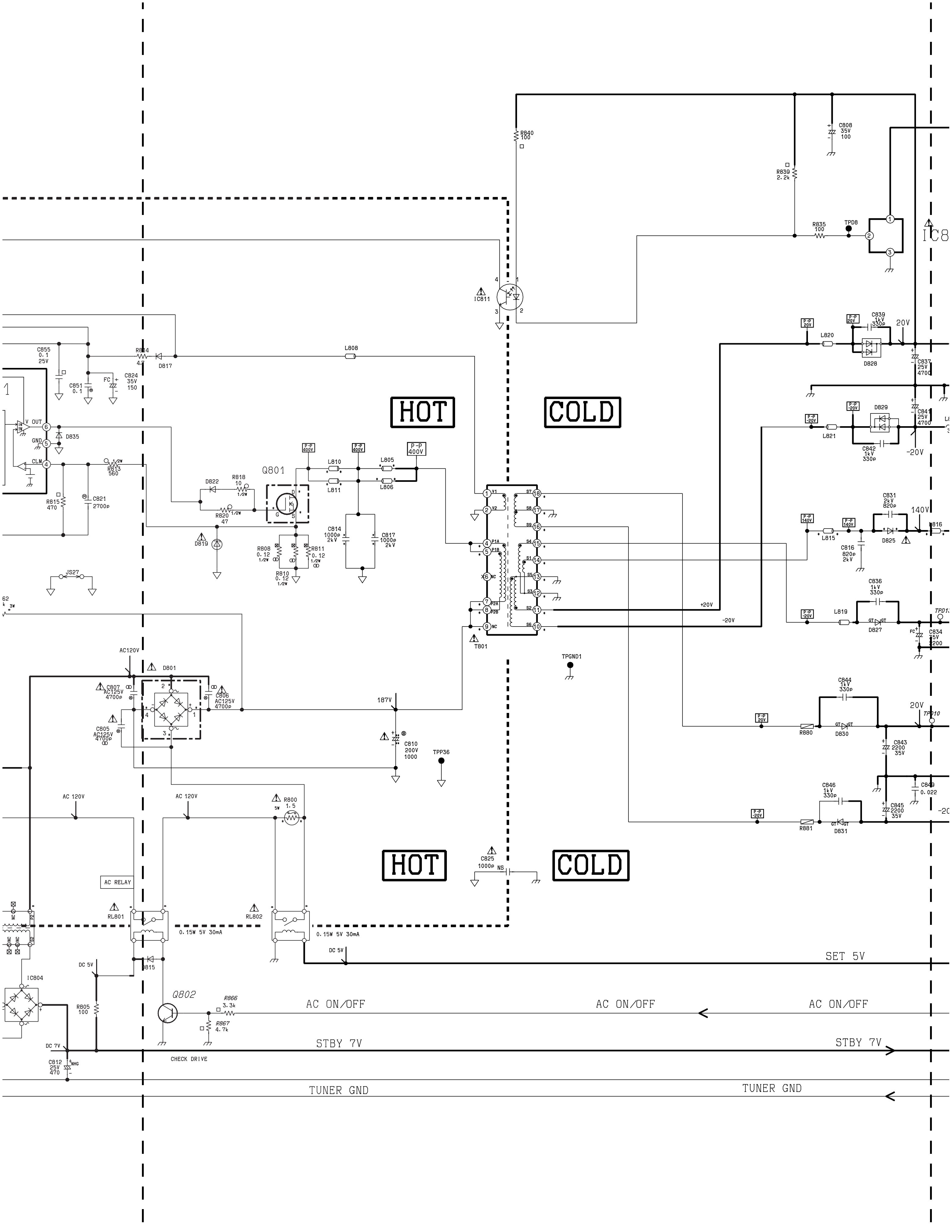
1. Un símbolo como ③ indica el punto para medir una señal. (La medición puede hacerse en el punto con mayor accesibilidad, siempre que sea común al indicado.)
2. Se midieron utilizando un generador con formato NTSC conectado a la terminal de la antena. (Patrón de 8 Barras de Colores EAI, formato NTSC de 100 IREs para el Blanco y 7.5 IREs para el Negro.)
3. Los ajustes de usuario de los Menus PICTURE y AUDIO se normalizaron. Posteriormente el nivel de volumen se ajusta al mínimo.
4. Las formas de onda de Video y Color fueron tomadas con un osciloscopio de banda alta y con un punta de prueba de baja capacitancia (10 a 1). La forma y amplitud de las ondas puede variar según el tipo de osciloscopio que se utilice y sus características.
5. El símbolo de tierra ⏚ que aparece junto al número de la forma de onda, indica que se utiliza conexión a **Tierra Caliente** en el extremo negativo de la punta de prueba.

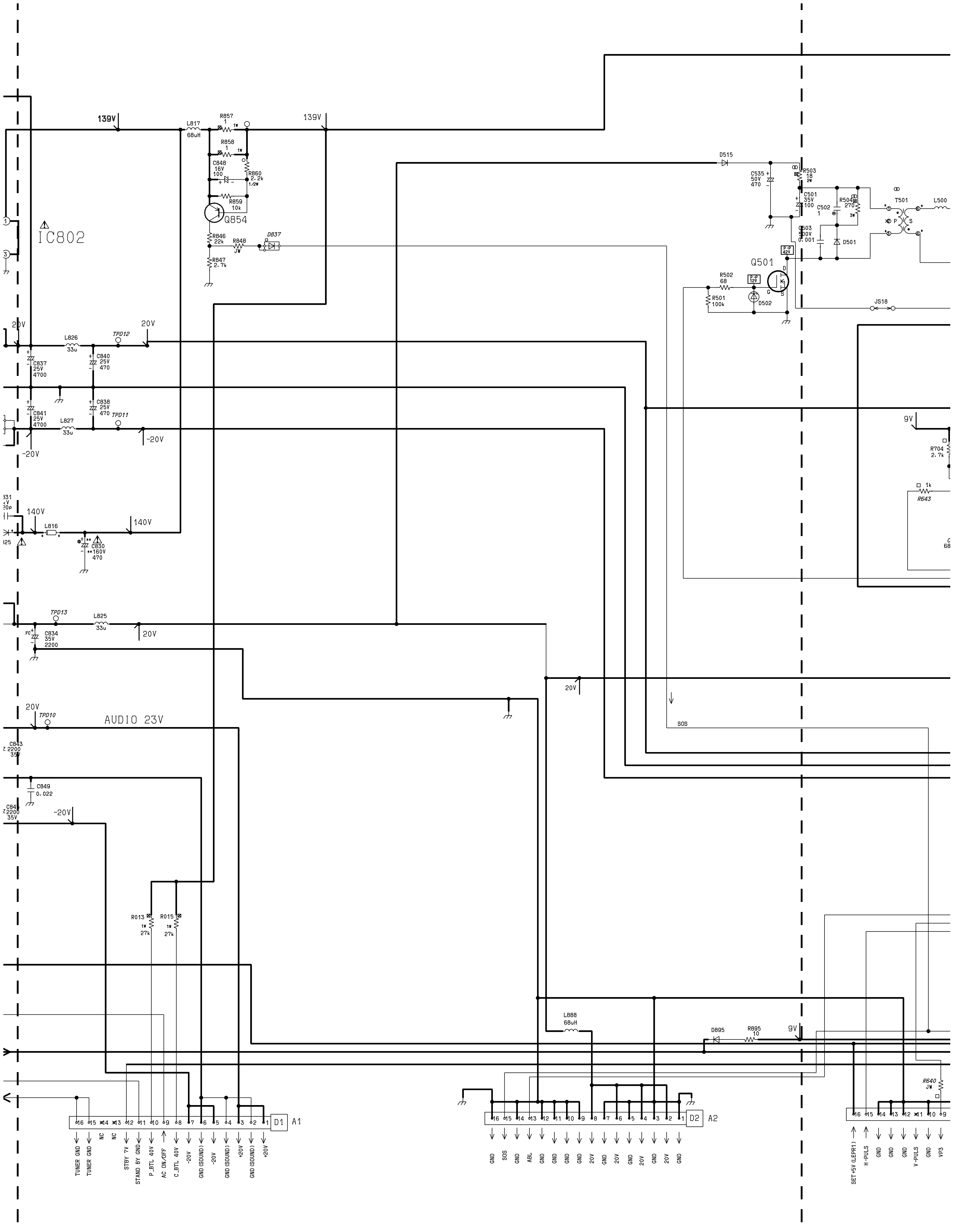
PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

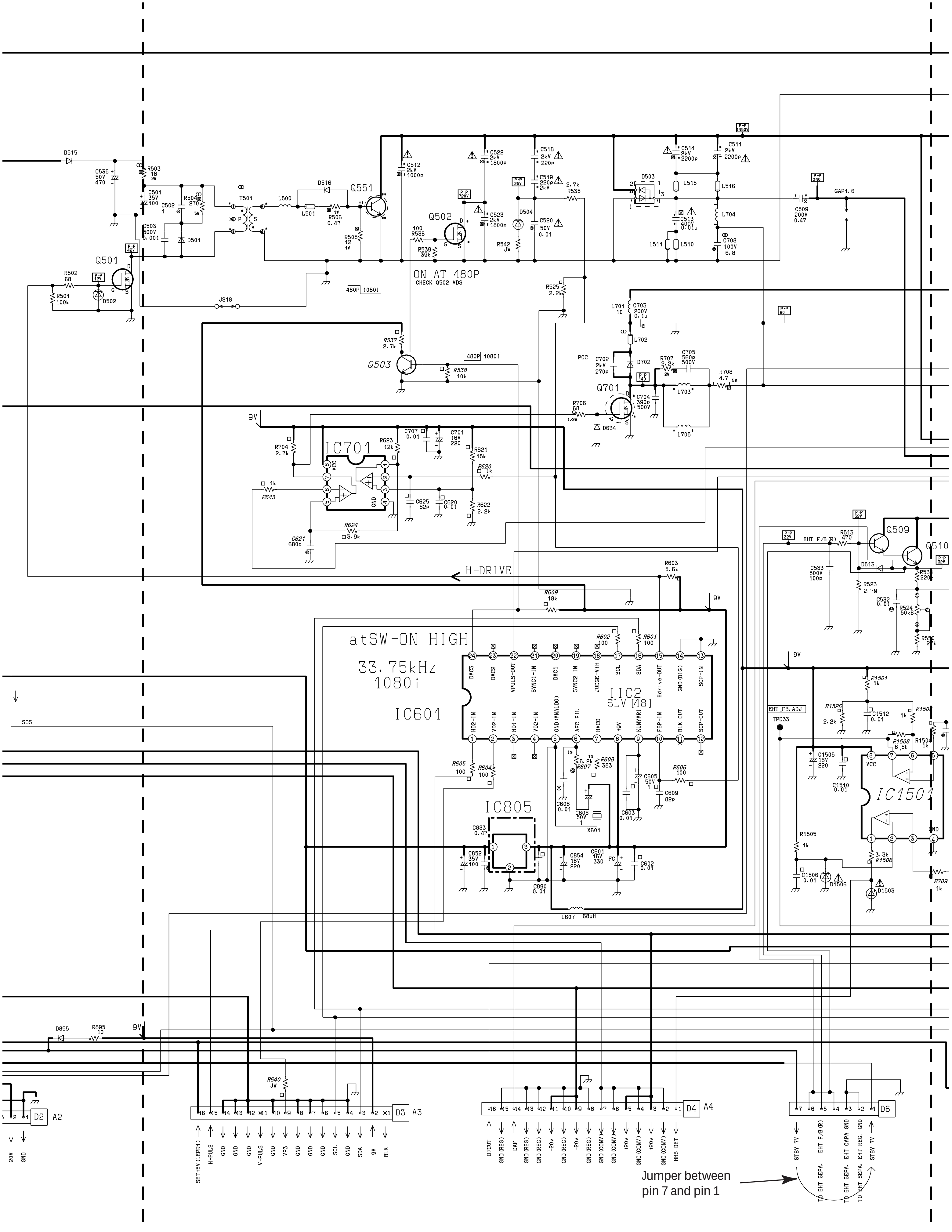
Notes

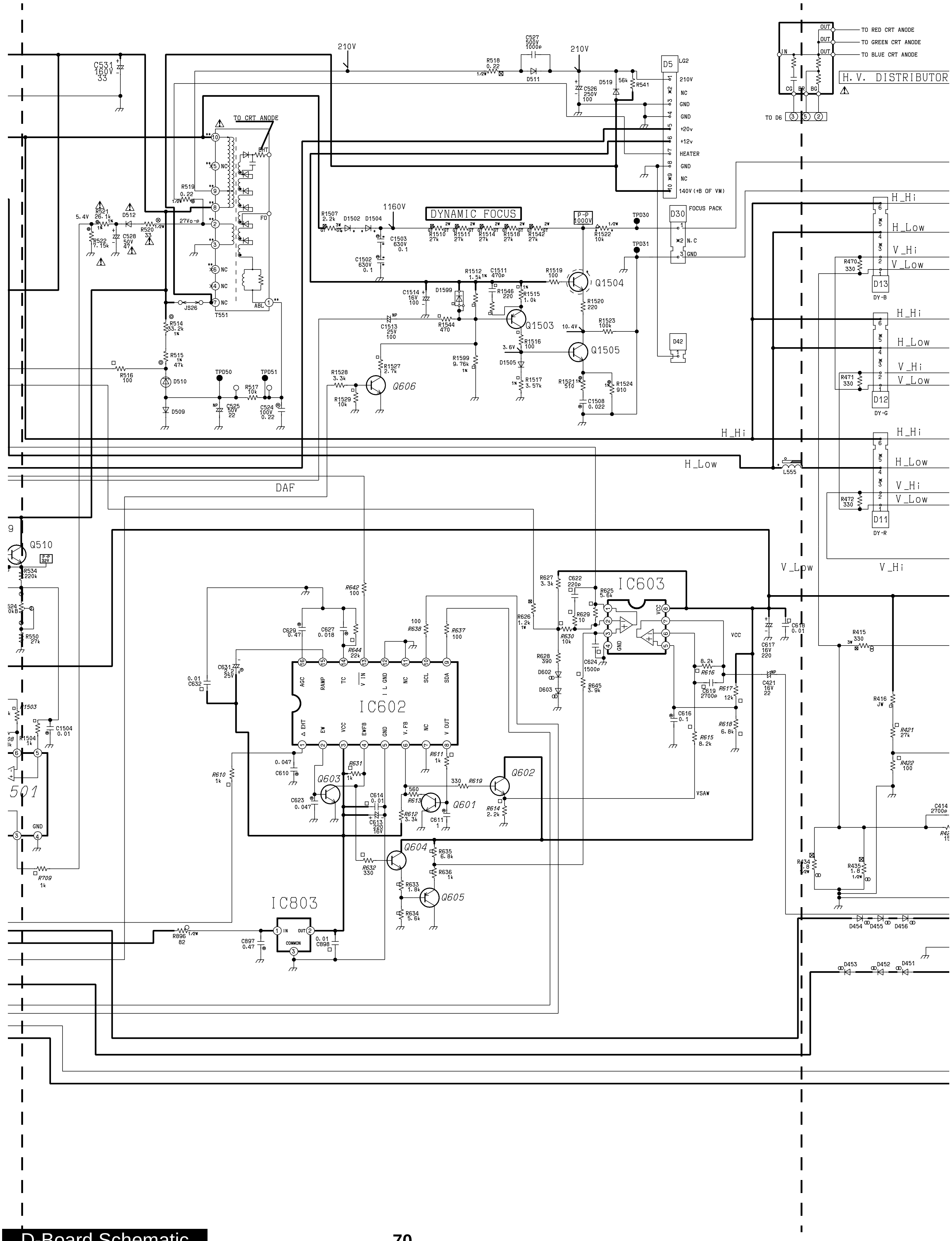


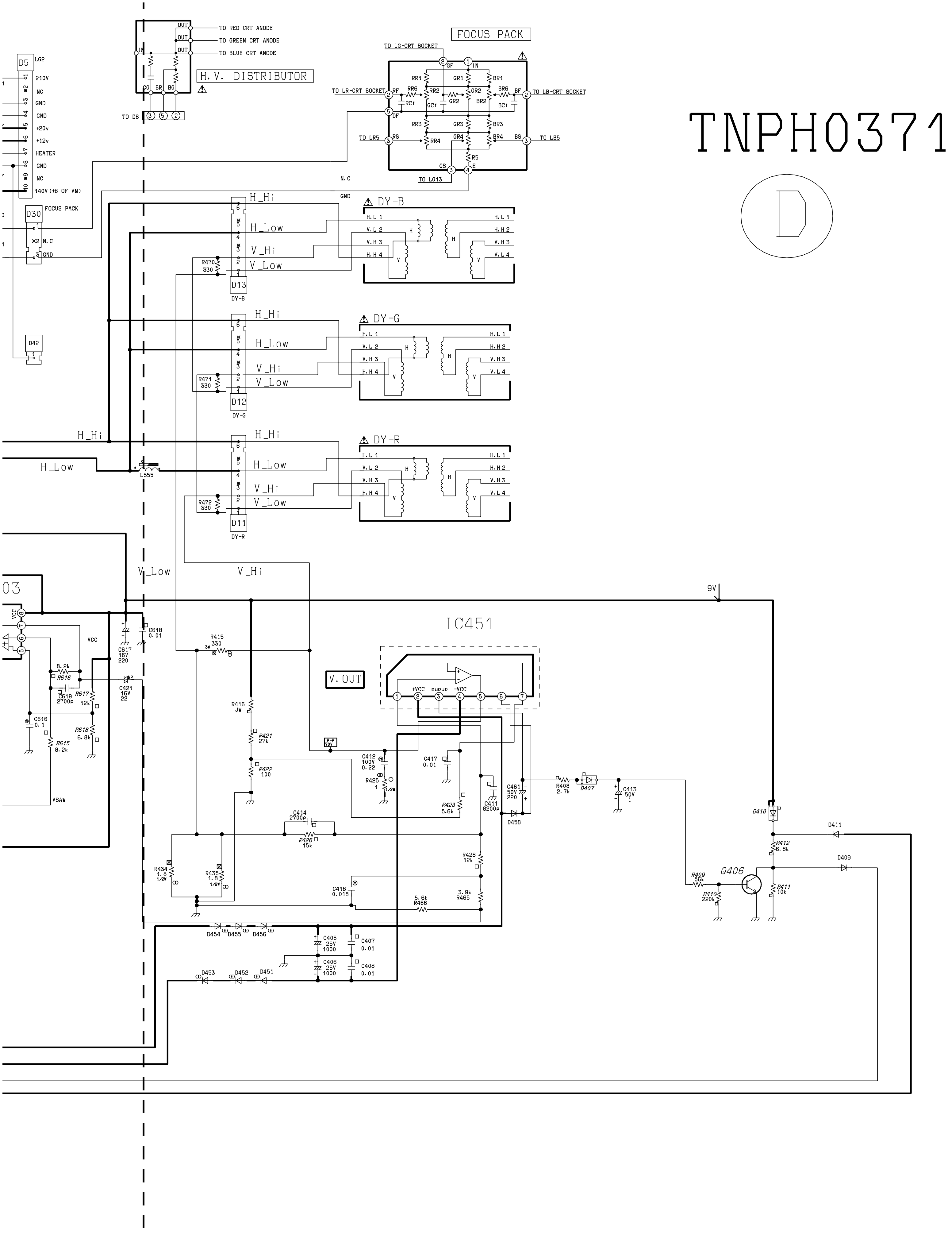
HOT
HOT
HOT
COLD
Q803
R822 2.2k
C832 0.01
R836 100
D818
R833 100
R809 2.2M
C822 50V 22
C826 0.1 25V
C820 0.33
R865 15k
C809 0.022 25V
R812 10k
R816 470
C823 150p
D816
IC801
VCC
V REF
OVP
CURRENT SOURSE
IFB
RS LATCH
Q
R
S
V OUT
GND
CLM
FB
TDL
SIGNAL CLUMP
T OFF
C819 1000p
R817 1% 2.0k
C815 1500p
C855 0.1 25V
C851 0.1
FC
C824 35V 150
R814 4.7
D817
D835
R813 1/2W 560
R815 470
C821 2700p
D822
R818 10 1/2W
Q801
R820 1/2W 47
D819
R808 0.12 1/2W
R810 0.12 1/2W
JS27
R862 33k 3W
AC120V
D801
C807 AC125V 4700p
C806 AC125V 4700p
C805 AC125V 4700p
AC CORD
M2
WHITE
M1
BLACK
AC120V
C801 AC250V 0.1
F801 6.3A 125V
JS2
JS1
JS3
JS4
L.F
L801
D802
AC120V
C802 AC250V 0.082
AC120V
L.F
L802
AC 120V
AC 120V
R800 5W 1.5
2.2mmGAP
2.2mmGAP
2.3mmGAP
2.3mmGAP
R832 8.2M
C803 2200p
TUNER
2200p C804
AC RELAY
RL801
RL802
0.15W 5V 30mA
T802
D815
DC 5V
IC804
Q802
R866 3.3k
R867 4.7k
R805 100
DC 7V
C812 25V 470 NHG
CHECK DRIVE
JS21
JS13
JS22
JS20


HOT
COLD
HOT
COLD
IC811
IC8
R840 100
R839 2.2k
C808 35V 100
R835 100
TPD8
C855 0.1 25V
C851 0.1
C824 35V 150
R814 4.7
D817
L808
V OUT
GND
CLM
D835
R813 560 1/2W
R815 470
C821 2700p
D822
R818 10 1/2W
R820 47 1/2W
Q801
D819
R808 0.12 1/2W
R810 0.12 1/2W
R811 0.12 1/2W
JS27
L810
L811
L805
L806
P-P 400V
C814 1000p 2kV
C817 1000p 2kV
T801
V1
V2
P1A
P1B
NC
P2A
P2B
S7
S8
S9
S4
S1
S5
S3
S2
S6
+20V
-20V
TPGND1
AC120V
D801
C807 AC125V 4700p
C806 AC125V 4700p
C805 AC125V 4700p
187V
C810 200V 1000
TPP36
P-P 20V
L820
C839 1kV 330p
20V
D828
C837 25V 4700
D829
P-P -20V
C841 25V 4700
L821
C842 1kV 330p
-20V
C831 2kV 820p
140V
P-P 140V
L815
C816 820p 2kV
D825
L816
C836 1kV 330p
L819
D827
TPD1
C834 35V 2200
C844 1kV 330p
20V
TPD10
R880
D830
C843 2200 35V
C849 0.022
C846 1kV 330p
R881
D831
C845 2200 35V
-20
AC 120V
AC 120V
R800 1.5 5W
C825 1000p NS
AC RELAY
RL801
RL802
0.15W 5V 30mA
0.15W 5V 30mA
DC 5V
DC 5V
D815
SET 5V
IC804
R805 100
Q802
R866 3.3k
R867 4.7k
AC ON/OFF
AC ON/OFF
AC ON/OFF
DC 7V
C812 25V 470 NHG
STBY 7V
STBY 7V
CHECK DRIVE
TUNER GND
TUNER GND


IC802
139V
L817
68uH
R857
1
1W
R858
1
1W
C848
16V
100
R860
2.2k
1/2W
R859
10k
Q854
R846
22k
R848
JW
D837
R847
2.7k
139V
D515
C535
50V
470
R503
18
2W
C501
35V
100
C502
1
R504
270
3W
T501
L500
P
S
C503
500V
0.001
D501
P-P
42V
Q501
D
G
S
R502
68
P-P
12V
R501
100k
D502
JS18
20V
L826
33u
TPD12
20V
C837
25V
4700
C840
25V
470
C838
25V
470
C841
25V
4700
L827
33u
TPD11
-20V
-20V
9V
R704
2.7k
1k
R643
140V
L816
C830
160V
470
140V
TPD13
L825
33u
C834
35V
2200
20V
20V
SOS
20V
TPD10
AUDIO 23V
C843
2200
35V
C849
0.022
C845
2200
35V
-20V
R013
1W
27k
R015
1W
27k
L888
68uH
D895
R895
10
9V
R640
JW
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
D1
A1
TUNER GND
TUNER GND
NC
NC
STBY 7V
STAND BY GND
P_BTL 40V
AC ON/OFF
C_BTL 40V
-20V
GND(SOUND)
-20V
GND(SOUND)
+20V
GND(SOUND)
+20V
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
D2
A2
GND
SOS
GND
ABL
GND
GND
GND
GND
20V
GND
20V
GND
20V
GND
20V
GND
16 15 14 13 12 11 10 9
SET+5V (LEPR1)
H-PULS
GND
GND
GND
V-PULS
GND
VP3


Q501
Q502
Q503
Q509
Q510
Q551
Q701
T501
D515
D501
D502
D503
D504
D513
D516
D634
D702
D895
D1503
D1506
ON AT 480P
CHECK Q502 VDS
480P 1080I
IC701
H-DRIVE
atSW-ON HIGH
33.75kHz
1080i
IC601
IIC2
SLV [48]
IC805
IC1501
PCC
GAP1.6
EHT F/B (R)
EHT_FB. ADJ
TPD33
SOS
9V
DAC3
DAC2
VPULS-OUT
SYNC1-IN
DAC1
SYNC2-IN
JUDGE-V/H
SCL
SDA
Hdrive-OUT
GND (DIG)
SCP-IN
HD2-IN
VD2-IN
HD1-IN
VD2-IN
GND (ANALOG)
AFC FIL
HVCO
+9V
KUNYARI
FBP-IN
BLK-OUT
SCP-OUT
L607 68uH
X601
D2
A2
D3
A3
D4
A4
D6
20V
GND
SET+5V (LEPR1)
H-PULS
GND
GND
GND
V-PULS
GND
VP3
GND
GND
GND
SCL
GND
SDA
9V
BLK
DFCUT
GND (REG)
DAF
GND (REG)
GND (REG)
-20v
GND (REG)
-20v
GND (REG)
GND (CONV)
GND (CONV)
+20v
GND (CONV)
+20v
GND (CONV)
HHS DET
STBY 7V
EHT F/B (R)
EHT CAPA GND
EHT REG. GND
STBY 7V
TO EHT SEPA.
TO EHT SEPA.
TO EHT SEPA.
Jumper between
pin 7 and pin 1


C531
160V
33
210V
R518
0.22
1/2W
C527
500V
1000p
D511
210V
C526
250V
100
D519
56k
R541
D5
LG2
210V
NC
GND
GND
+20v
+12v
HEATER
GND
NC
140V (+B OF VM)
TO RED CRT ANODE
TO GREEN CRT ANODE
TO BLUE CRT ANODE
OUT
IN
CG
BR
BG
H.V. DISTRIBUTOR
TO D6
TO CRT ANODE
EHT
R519
0.22
1/2W
27Vo-p
FO
R521
26.1k
5.4V
D512
R520
33
1/2W
C528
50V
47
R522
7.15k
NC
JS26
T551
ABL
R514
33.2k
R515
47k
R516
100
D510
D509
TPD50
TPD51
R517
10k
C525
50V
22
C524
100V
0.22
R1507
2.2k
D1502
D1504
1160V
C1503
630V
0.1
C1502
630V
0.1
DYNAMIC FOCUS
R1510
27k
R1511
27k
R1514
27k
R1518
27k
R1542
27k
P-P
1000V
R1522
10k
TPD30
TPD31
D30
FOCUS PACK
N.C
GND
R1512
1.5k
C1511
470p
R1519
100
Q1504
C1514
16V
100
D1599
R1546
220
R1515
1.0k
R1520
220
R1544
470
Q1503
C1513
25V
100
10.4V
R1523
100k
R1516
100
3.6V
Q1505
D1505
R1599
9.76k
R1517
3.57k
R1521
510
R1524
910
C1508
0.022
D42
R1528
3.3k
R1527
2.7k
Q606
R1529
10k
H_Hi
H_Low
V_Hi
V_Low
R470
330
D13
DY-B
R471
330
D12
DY-G
R472
330
D11
DY-R
L555
DAF
Q510
P-P
32V
R534
220k
R550
27k
R1503
C1504
0.01
R1504
1k
GND
R709
1k
IC603
R627
3.3k
C622
220p
R625
5.6k
R626
1.2k
1W
R629
10
R630
10k
VCC
GND
R628
390
D602
D603
C624
1500p
R645
3.9k
C617
16V
220
C618
0.01
VCC
R415
330
3W
R416
JW
R421
27k
R422
100
C414
2700p
R434
1.8
1/2W
R435
1.8
1/2W
D454
D455
D456
D453
D452
D451
R642
100
C629
0.47
C627
0.018
R644
22k
100
R638
R637
100
C631
2.2
25V
0.01
C632
IC602
AGC
RAMP
TC
V IN
I L GND
NC
SCL
SDA
Δ EHT
EW
VCC
EWFB
GND
V.FB
NC
V OUT
8.2k
R616
C619
2700p
R617
12k
C421
16V
22
C616
0.1
R618
6.8k
R615
8.2k
VSAW
0.047
C610
R610
1k
R631
1k
Q603
C623
0.047
C614
0.01
C613
220
16V
560
R613
R612
3.3k
Q601
C611
1
R611
1k
330
R619
Q602
R614
2.2k
Q604
R635
6.8k
R636
1k
R632
330
R633
1.8k
Q605
R634
5.6k
IC803
IN
OUT
COMMON
R896
82
1/2W
C897
0.47
0.01
C898
501


TNPH0371
D
H.V. DISTRIBUTOR
OUT
IN
CG
BR
BG
TO RED CRT ANODE
TO GREEN CRT ANODE
TO BLUE CRT ANODE
TO D6
FOCUS PACK
TO LG-CRT SOCKET
TO LR-CRT SOCKET
TO LB-CRT SOCKET
TO LR5
TO LB5
TO LG13
GF
RF
BF
DF
RS
BS
GS
E
RR1
RR2
RR3
RR4
RR6
RCf
GR1
GR2
GR3
GR4
GCf
BR1
BR2
BR3
BR4
BR6
BCf
R5
D5
LG2
210V
NC
GND
+20v
+12v
HEATER
140V (+B OF VM)
N.C
D30
FOCUS PACK
GND
D42
H_Hi
H_Low
V_Hi
V_Low
DY-B
DY-G
DY-R
H.L 1
V.L 2
V.H 3
H.H 4
H.H 2
V.L 4
H
V
R470
330
R471
330
R472
330
D13
D12
D11
L555
03
VCC
9V
IC451
V.OUT
+VCC
PUPUP
-VCC
C618
0.01
C617
16V
220
C421
16V
22
NP
8.2k
R616
C619
2700p
R617
12k
R618
6.8k
C616
0.1
R615
8.2k
VSAW
R415
330
3W
R416
JW
R421
27k
R422
100
P-P
70V
C412
100V
0.22
R425
1
1/2W
C417
0.01
R423
5.6k
C411
8200p
C461
50V
220
D458
R408
2.7k
D407
C413
50V
1
C414
2700p
R426
15k
R428
12k
R434
1.8
1/2W
R435
1.8
1/2W
C418
0.018
5.6k
R466
3.9k
R465
D454
D455
D456
C405
25V
1000
C407
0.01
C406
25V
1000
C408
0.01
D453
D452
D451
D410
D411
R412
6.8k
D409
Q406
R409
56k
R410
220k
R411
10k

D-BOARD INTEGRATED CIRCUITS - TNPH0371

IC451	
1	0.04
2	16.74
3	-16.74
4	-17.85
5	0.64
6	16.35
7	0.04

IC805	
1	19.04
2	GND
3	9.06

IC811	
1	19.04
2	18.03

IC601	
1	0.24
2	0.06
3	N.C.
4	N.C.
5	GND
6	6.50
7	* 5.17
8	9.06
9	2.50
10	0.60
11	0.86
12	N.C.
13	GND
14	GND
15	3.10
16	4.43
17	4.51
18	N.C.
19	N.C.
20	N.C.
21	N.C.
22	4.87
23	N.C.
24	0.28

IC602	
1	4.28
2	0.62
3	12.01
4	6.08
5	GND
6	4.11
7	N.C.
8	0.61
9	4.47
10	4.43
11	N.C.
12	GND
13	4.86
14	3.86
15	6.02
16	3.19

IC603	
1	3.83
2	5.29
3	5.29
4	GND
5	3.25
6	3.25
7	2.96
8	9.06

IC1501	
1	0.00
2	5.29
3	4.61
4	GND
5	5.82
6	5.82
7	4.28
8	9.06

IC701	
1	5.92
2	0.60
3	1.16
4	GND
5	5.98
6	3.83
7	6.70
8	9.06

IC801 ↓	
1	0.06
2	0.06
3	0.07
4	0.06
5	GND
6	-0.14
7	0.09
8	0.70
9	0.07

IC802	
1	139.20
2	17.93
3	GND

IC803	
1	16.01
2	12.01
3	GND

D-BOARD TRANSISTORS - TNPH0371

	Q406	Q503	Q509	Q510	Q551 ↓	Q601	Q602	Q603	Q604
B	6.09	0.28	29.39	31.82	0.07	0.60	4.11	0.62	6.07
C	0.06	8.46	138.80	138.80	-4.53	2.76	9.06	6.08	9.06
E	0.00	0.00	31.83	31.32	0.21	0.00	3.53	0.00	5.49

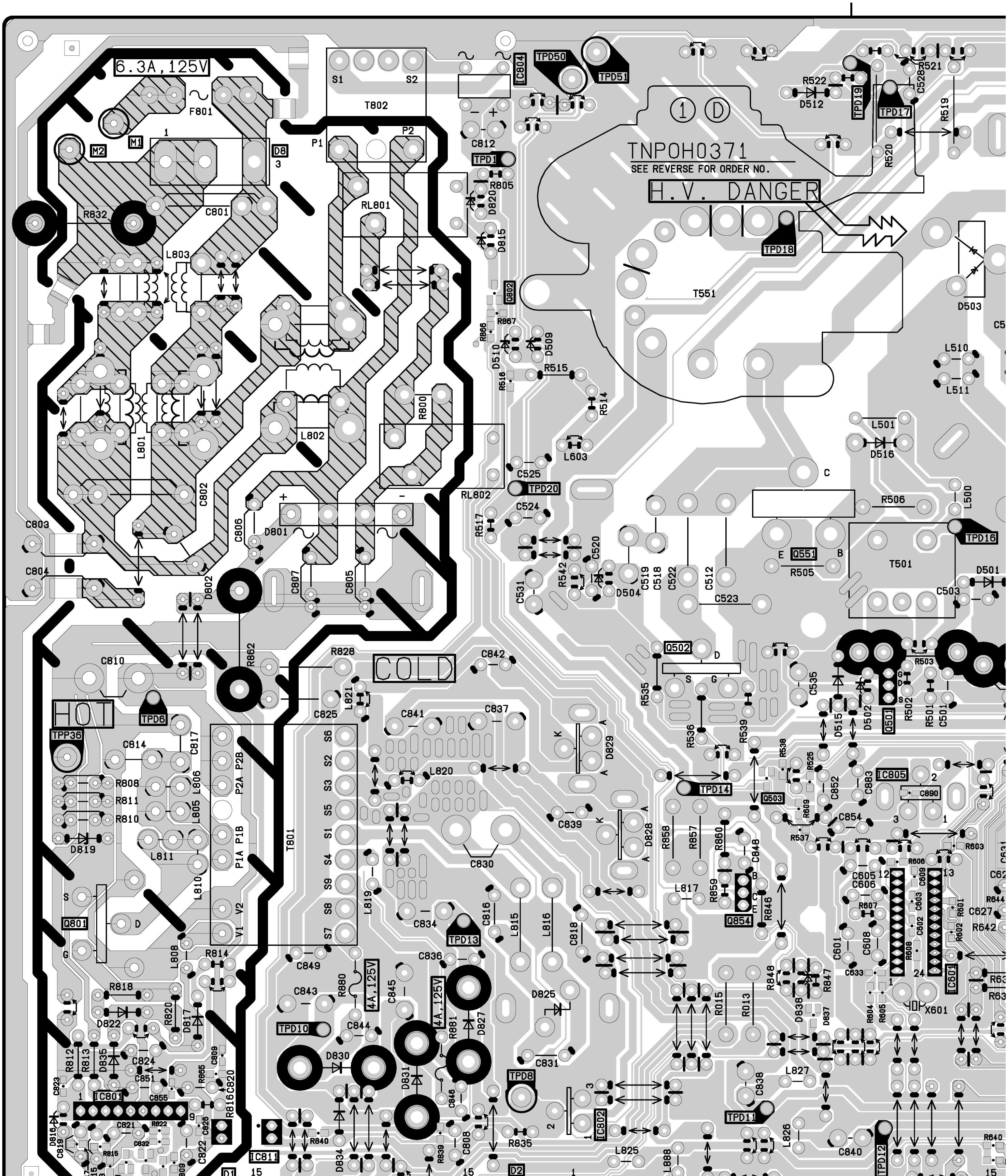
	Q605	Q606	Q802 ↓	Q803 ↓	Q854	Q1503	Q1504	Q1505
B	4.13	0.03	0.07	0.07	138.80	10.40	11.97	4.04
C	0.00	10.40	0.07	0.09	0.00	4.14	510.00	10.49
E	4.71	0.00	0.07	0.07	139.10	10.98	11.46	3.99

	Q501	Q502	Q701	Q801 ↓
S	0.00	0.00	0.00	0.07
D	16.07	0.01	30.80	-40.20
G	3.09	8.44	6.70	0.12

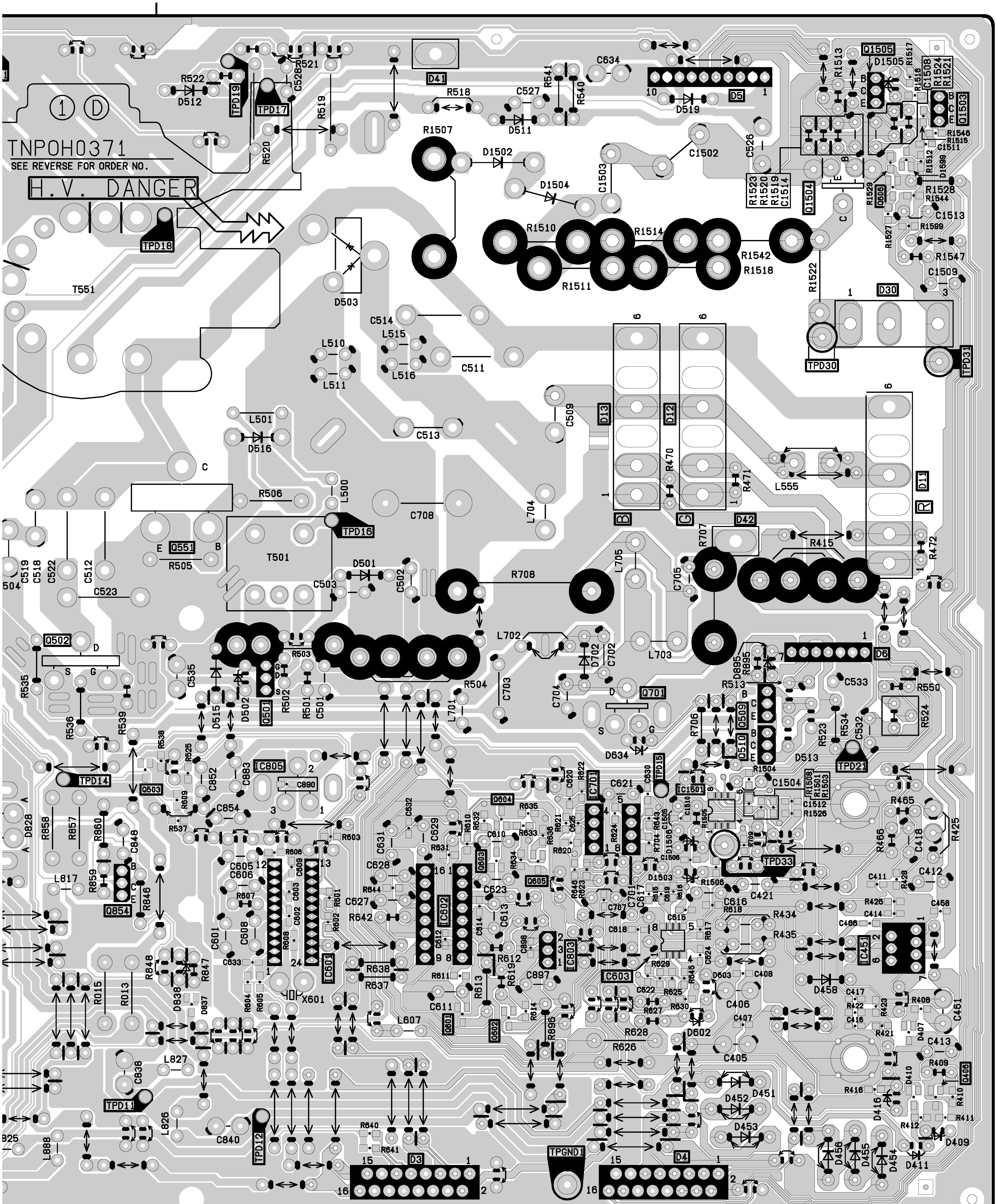
Voltages marked with ↓ use HOT ground, please check schematic to confirm the type of ground used for each component

*** Set may reset when probing this pin. If TV doesn´t turn ON, unplug from AC outlet, plug it back and turn it ON.**

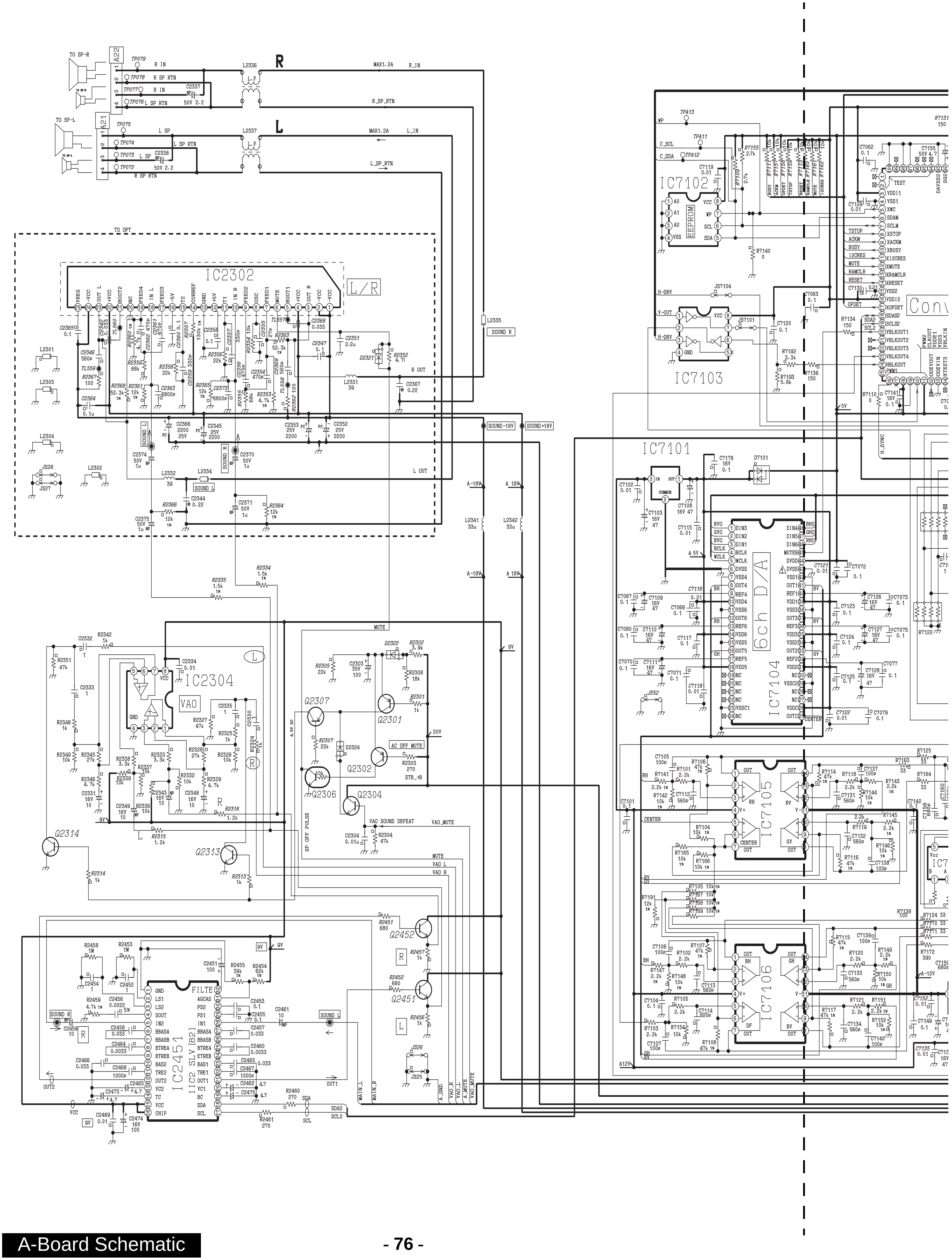
NOTES:

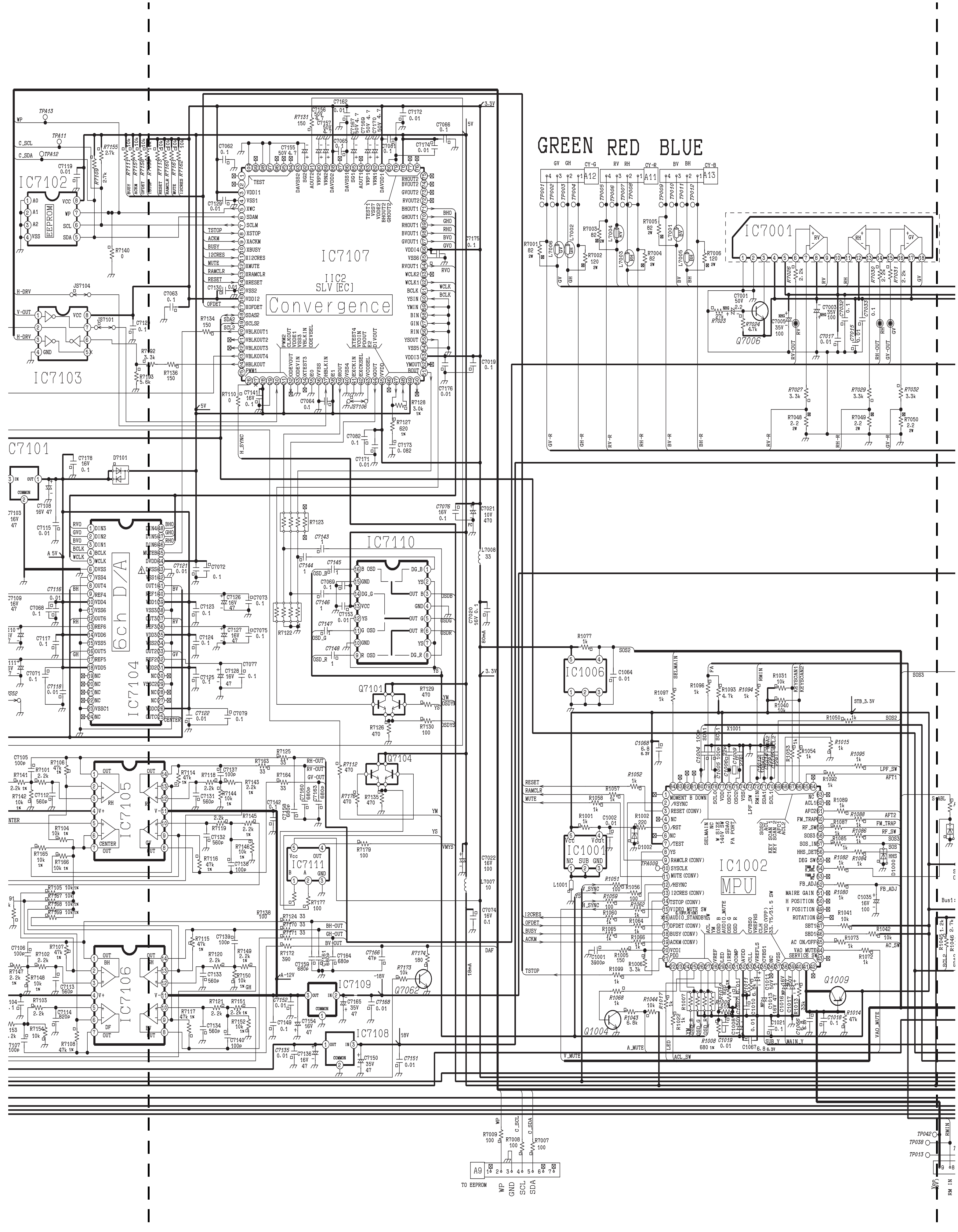

6.3A,125V
F801
M1
M2
D8
T802
S1
S2
P1
P2
RL801
R832
C801
L803
L801
C802
L802
R800
RL802
D801
C806
C807
C805
C803
C804
D802
R862
C810
HOT
TPD6
TPP36
C814
C817
R808
R811
R810
L806
L805
D819
L811
L810
Q801
S
D
G
L808
R814
R818
D822
R820
D817
R812
R813
D835
C824
C851
R855
C809
C820
IC801
C855
C821
R822
R816
C826
C832
C822
R815
R817
C833
D818
Q803
R836
R809
D816
C819
C823
IC811
D1
15
16
1
2
T801
P2A
P2B
P1A
P1B
V1
V2
S6
S2
S3
S5
S1
S4
S9
S8
S7
R828
COLD
C842
C825
L821
C841
C837
L820
L819
C830
C839
C834
TPD13
C816
L815
L816
C818
C849
C836
C843
R880
4A,125V
C845
R881
D827
TPD10
C844
D830
D831
C846
C808
R839
D834
R840
D825
C831
TPD8
IC802
R835
L825
L888
D2
IC804
TPD50
TPD51
C812
TPD1
R805
D820
D815
Q802
R867
R866
D510
D509
R516
R515
R514
L603
C525
TPD20
C524
R517
C520
R542
C531
D504
C519
C518
C522
C512
C523
1D
TNPOH0371
SEE REVERSE FOR ORDER NO.
H.V. DANGER
TPD18
T551
R522
D512
TPD19
TPD17
C528
R521
R519
R520
D503
L510
L511
L501
D516
C
R506
L500
TPD16
E
Q551
B
R505
T501
D501
C503
Q502
D
S
G
R535
R536
R539
C535
D515
D502
Q501
R502
R503
R501
C501
TPD14
Q503
R538
R525
C852
C883
IC805
C890
R609
C854
R537
R603
R606
C609
C605
C606
R607
C603
C602
R601
R644
C627
R642
C601
C608
R608
R602
C633
IC603
R604
R605
X601
D829
D828
K
A
R858
R857
R860
C848
R859
R846
Q854
L817
R848
R847
R015
R013
D838
D837
L827
C838
TPD11
L826
C840
TPD12
R640
12
13
24
3

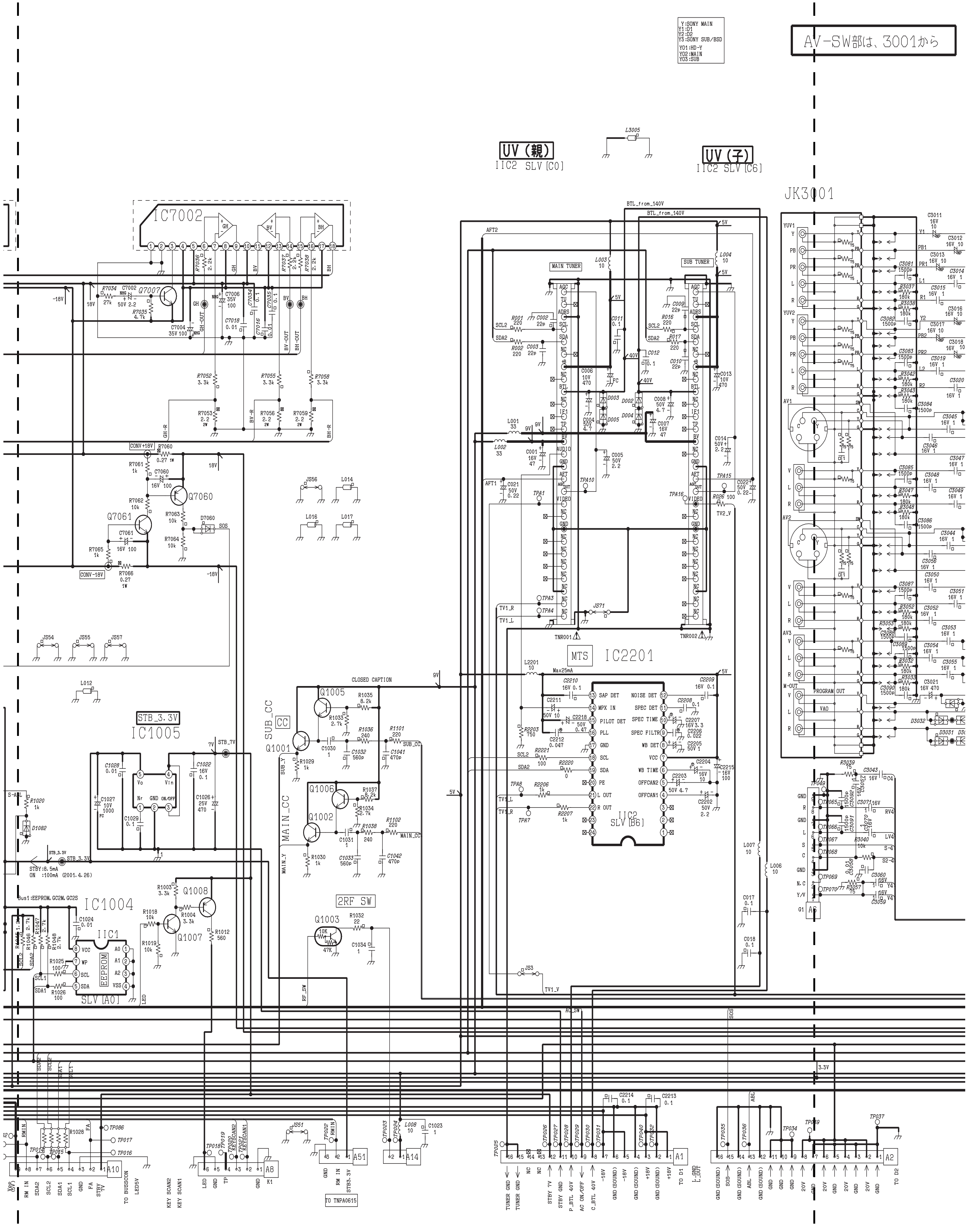
D-Board Layout

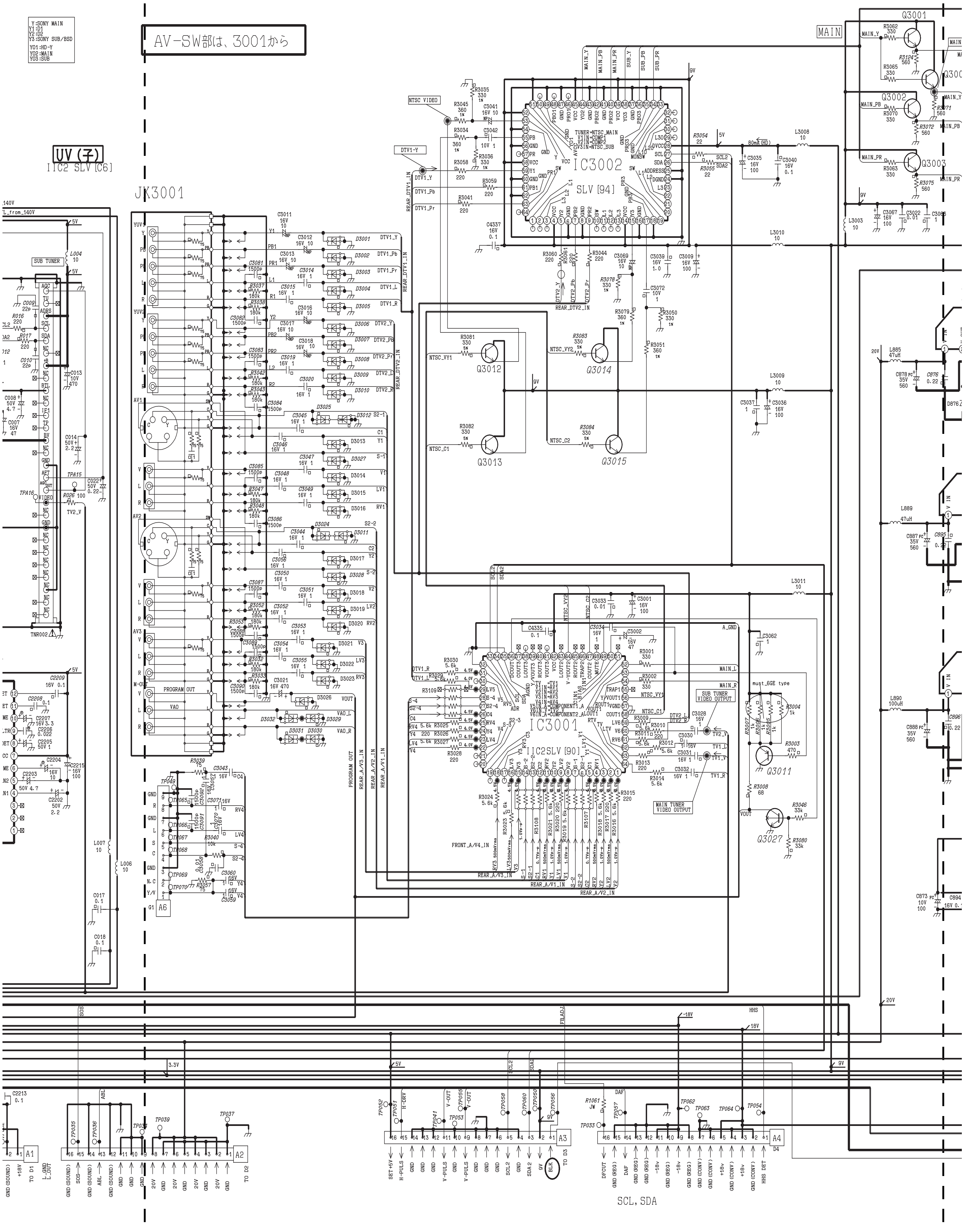


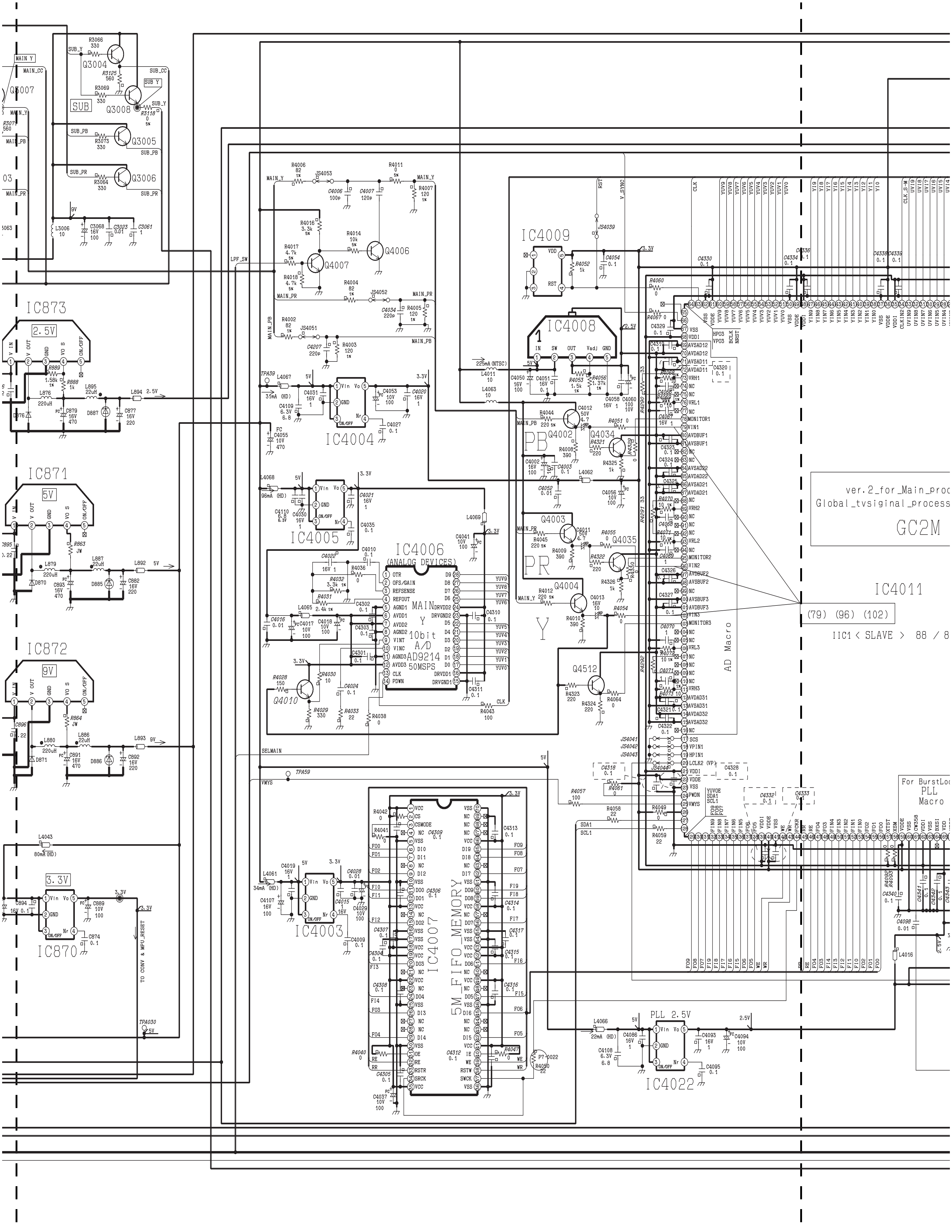
①
D
TNP0H0371
SEE REVERSE FOR ORDER NO.
H.V. DANGER
TPD19
TPD17
TPD18
R522
D512
R521
C528
R519
R520
D41
R518
C527
R541
R540
D511
C634
D5
10
1
D519
Q1505
R1513
D1505
R1517
R1516
C1508
R1524
R1521
Q1503
R1546
R1515
R1511
R1512
D1599
R1523
R1520
R1519
C1514
Q1504
Q508
R1529
R1528
R1544
C1513
R1527
R1599
R1547
C1509
C526
C1502
C1503
R1507
D1502
D1504
R1510
R1514
R1542
R1518
R1511
R1522
D30
TPD30
TPD31
T551
D503
C514
L515
L510
L516
L511
C511
C509
D13
D12
R470
R471
B
G
L555
D11
R
6
C513
L501
D516
C
R506
L500
C708
L704
D42
R707
R415
R472
Q551
E
R505
T501
TPD16
D501
C519
C518
C522
C512
C523
504
C503
C502
R708
L705
C705
Q502
D
S
G
R535
C535
R503
R502
R501
C501
Q501
D515
D502
R504
C703
L702
D702
C702
L703
D6
D895
R895
R513
C533
R550
R524
C704
Q701
L701
R536
R539
R538
R525
C852
C883
IC805
C890
Q509
Q510
R706
R534
C532
R523
D513
TPD21
D634
TPD14
Q503
R809
C854
R537
C632
Q604
R635
C620
R622
C701
C621
C630
TPD15
IC1501
C1504
R1504
R1502
R1501
R1503
C1512
R1526
R465
R425
D828
R858
R857
R860
C848
R603
R606
C605
C606
C609
C631
C629
R631
R610
R632
C610
R633
R621
R636
R620
C625
R624
R643
D1506
C1506
TPD33
R466
C418
L817
R859
R846
Q854
C628
C603
C602
R601
R602
R607
C644
C627
R642
C612
IC602
C623
C603
C613
Q605
R640
R623
C707
C617
R616
C619
D1503
R1505
C616
R618
C421
C411
R428
C412
C426
C458
C414
C466
R434
R435
IC451
C601
C608
C633
R609
IC601
R848
R847
D838
D837
X601
R604
R605
R638
R637
R611
R612
R619
C897
IC603
C896
IC803
C618
C615
R617
R629
R645
C624
D603
C408
D458
C417
C416
R422
R423
R421
R408
C461
R015
R013
L607
C611
Q601
Q602
R613
R614
R896
C622
R625
R627
R630
C406
C407
D602
R628
R626
C405
D407
C413
R409
D406
R410
R416
D410
R411
R412
D416
D409
L827
C838
TPD11
L826
C840
TPD12
R641
D3
15
16
2
TPGND1
D4
D452
D451
D453
D456
D455
D454
D411
825
L888

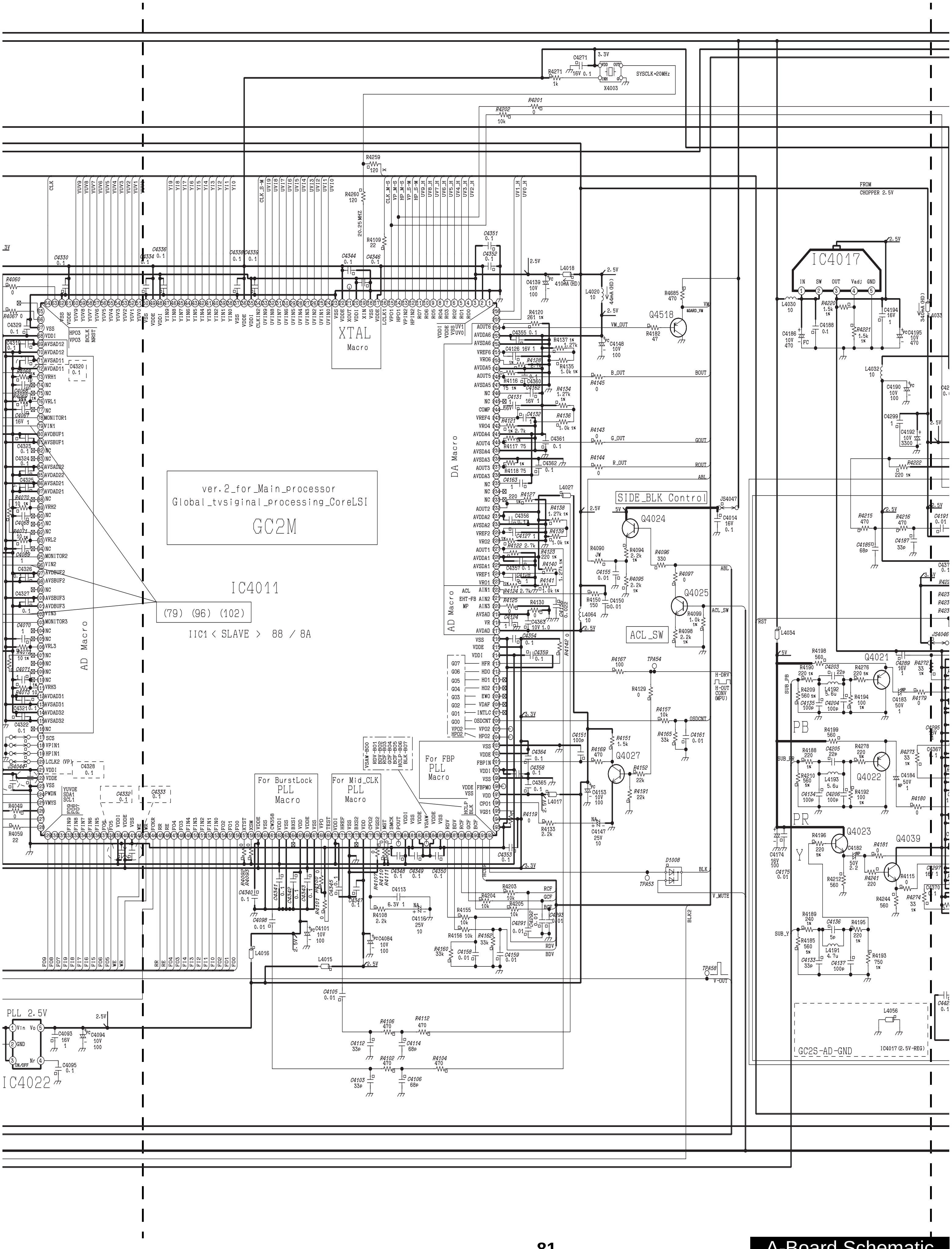

TO SP-R
TO SP-L
A22
A21
R
L
L2336
L2337
L.F
MAX1.2A
R_IN
L_IN
R_SP_RTN
L_SP_RTN
TO OPT
IC2302
L/R
SOUND R
SOUND L
SOUND-18V
SOUND+18V
R OUT
L OUT
A-18V
A 18V
L2341
L2342
IC2304
VAO
MUTE
9V
20V
AC OFF MUTE
STB_+B
VAO SOUND DEFEAT
VAO_MUTE
Q2301
Q2302
Q2304
Q2306
Q2307
Q2313
Q2314
Q2451
Q2452
IC2451
IIC2 SLV [82]
FILTE
OUT1
OUT2
MAIN_L
MAIN_R
A_GND
VAO_R
VAO_L
A_MUTE
VAO_MUTE
SDA2
SCL2
IC7102
EEPROM
IC7103
IC7101
IC7104
6ch D/A
IC7105
IC7106
CENTER
A12V
A-12V
Conv


IC7102
EEPROM
IC7103
IC7107
IIC2
SLV [EC]
Convergence
IC7101
IC7104
6ch D/A
IC7105
IC7106
IC7110
IC7111
IC7109
IC7108
Q7101
Q7104
Q7062
GREEN
RED
BLUE
IC7001
Q7006
IC1006
IC1001
IC1002
MPU
Q1009
Q1004
A9
TO EEPROM
WP
GND
SCL
SDA

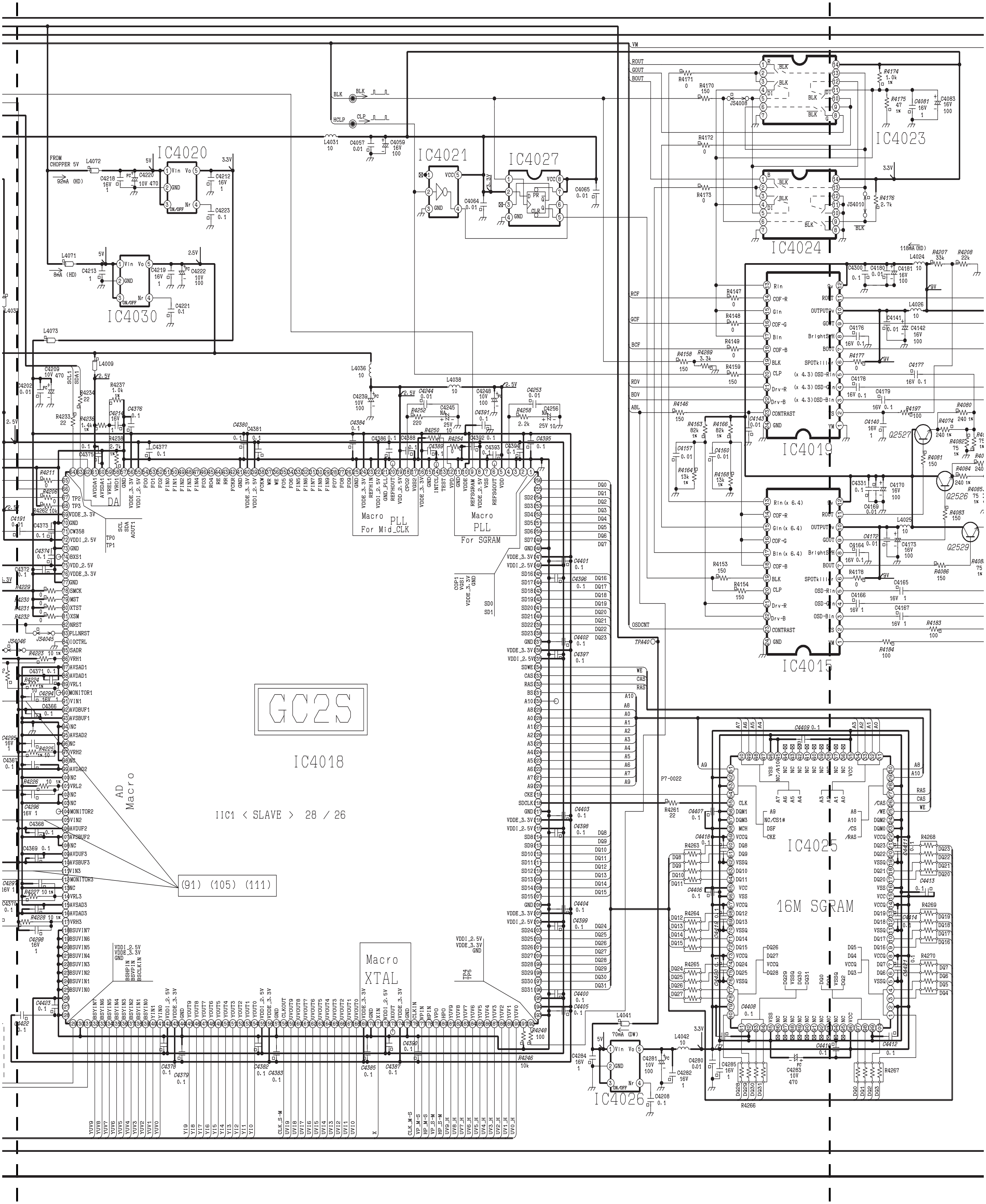

Y:SONY MAIN
Y1:D1
Y2:D2
Y3:SONY SUB/BSD
Y01:HD-Y
Y02:MAIN
Y03:SUB
AV-SW部は、3001から
UV(親)
IIC2 SLV[C0]
UV(子)
IIC2 SLV[C6]
L3005
JK3001
IC7002
GH
BV
BH
MAIN TUNER
SUB TUNER
BTL_from_140V
AFT2
TNR001
TNR002
MTS
IC2201
IIC2
SLV[B6]
SAP DET
MPX IN
PILOT DET
PLL
GND
SCL
SDA
PE
L OUT
R OUT
NOISE DET
SPEC DET
SPEC TIME
SPEC FILTR
WB DET
VCC
WB TIME
OFFCAN2
OFFCAN1
CLOSED CAPTION
SUB_CC
CC
MAIN_CC
Q1001
Q1002
Q1003
Q1005
Q1006
2RF SW
STB_3.3V
IC1005
IC1004
IIC1
EEPROM
SLV[A0]
Bus1:EEPROM,GC2M,GC2S
STBY:8.5mA
ON :100mA (2001.4.26)
Q1007
Q1008
Q7060
Q7061
Q7007
CONV+18V
CONV-18V
YUV1
YUV2
AV1
AV2
AV3
M-OUT
PROGRAM OUT
VAO
A10
A8
A51
A14
A1
A2
A6
TO BUSSCON
TO TNPA0615
TO D1
TO D2
K1
RM IN
SDA2
SCL2
SDA1
SCL1
GND
FA
STBY 7V
LED5V
KEY SCAN2
KEY SCAN1
LED
TP
RM IN
STB3.3V
TUNER GND
NC
STBY 7V
STBY GND
P_BTL 40V
AC ON/OFF
C_BTL 40V
GND(SOUND)
-18V
+18V
L_GND
L_OUT
SOS
ABL
20V
3.3V

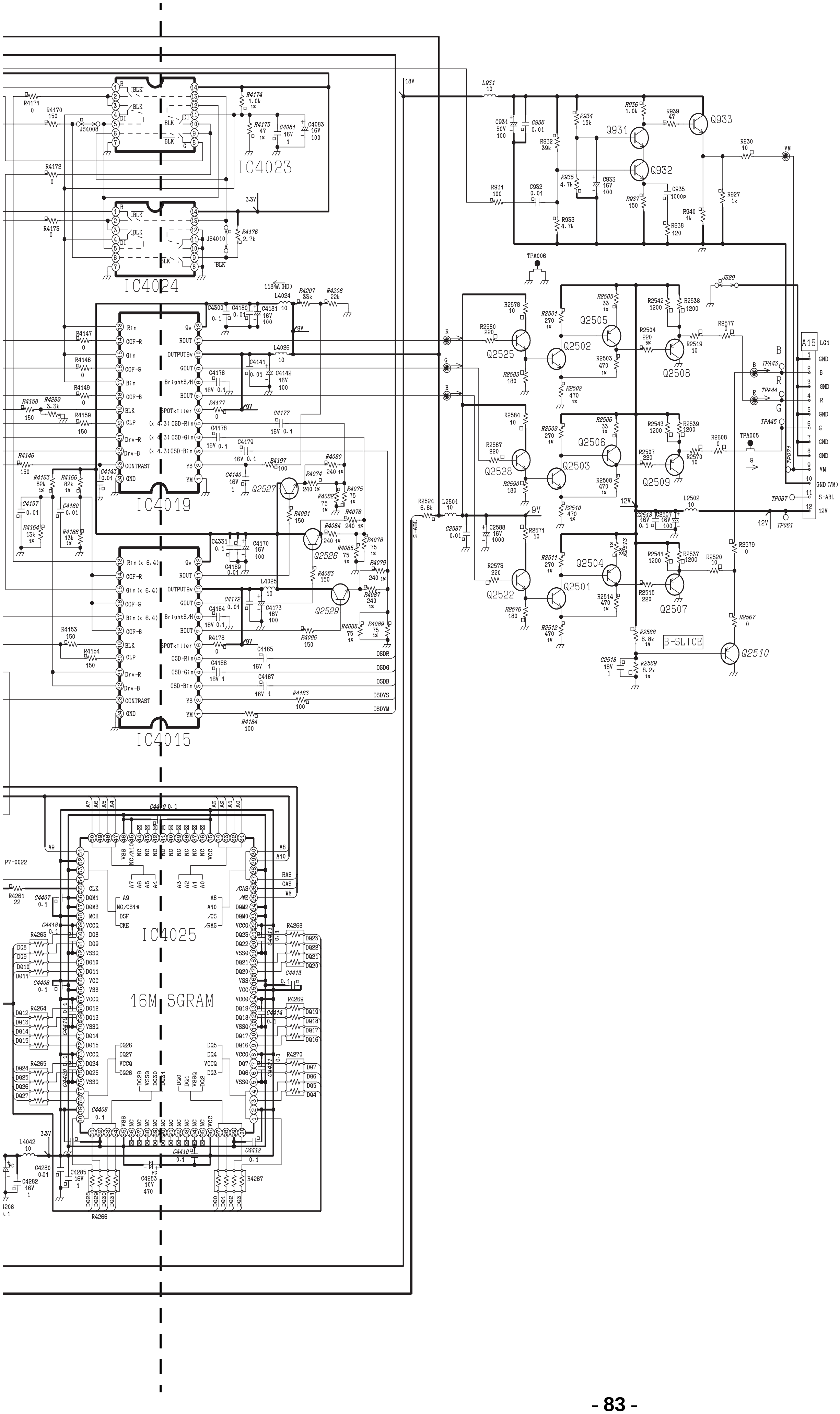

Y:SONY MAIN
Y1:D1
Y2:D2
Y3:SONY SUB/BSD
Y01:HD-Y
Y02:MAIN
Y03:SUB
AV-SW部は、3001から
UV(子)
IIC2 SLV[C6]
JK3001
SUB TUNER
TNR002
MAIN
Q3001
Q3002
Q3003
IC3002
SLV [94]
TUNER=NTSC_MAIN
Y1IN=COMP1
Y2IN=COMP2
Y3IN=NTSC_SUB
NTSC VIDEO
DTV1-Y
MAIN_Y
MAIN_PB
MAIN_PR
SUB_Y
SUB_PB
SUB_PR
REAR_DTV1_IN
REAR_DTV2_IN
Q3012
Q3013
Q3014
Q3015
NTSC_VY1
NTSC_VY2
NTSC_C1
NTSC_C2
IC3001
IIC2SLV [90]
PROGRAM OUT
VAO
AV1
AV2
AV3
M-OUT
SUB TUNER VIDEO OUTPUT
MAIN TUNER VIDEO OUTPUT
must_6GE type
Q3011
Q3027
FRONT_A/V4_IN
REAR_A/V1_IN
REAR_A/V2_IN
REAR_A/V3_IN
A6
A1
A2
A3
A4
D4
TO D1
TO D2
TO D3
SCL,SDA
3.3V
5V
9V
18V
-18V
20V
HHS
FB_ADJ
SCL2
SDA2
SET +5V
H-PULS
V-PULS
GND
SDA2
SCL2
DFCUT
DAF
+18V
-18v
HHS DET
SOS
ABL
BLK

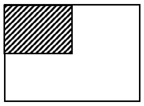

IC873
2.5V
IC871
5V
IC872
9V
IC870
3.3V
Q3004
Q3005
Q3006
Q3007
Q3008
SUB
SUB_Y
SUB_CC
SUB_PB
SUB_PR
MAIN_Y
MAIN_CC
MAIN_PB
MAIN_PR
LPF_SW
Q4006
Q4007
Q4010
IC4004
IC4005
IC4006
(ANALOG DEVICES)
MAIN
Y
10bit
A/D
AD9214
50MSPS
IC4003
IC4007
5M FIFO MEMORY
IC4009
IC4008
Q4002
Q4003
Q4004
Q4034
Q4035
Q4512
PB
PR
Y
AD Macro
IC4011
ver.2_for_Main_proc
Global_tvsiginal_process
GC2M
(79) (96) (102)
IIC1 < SLAVE > 88 / 8
For BurstLoc
PLL
Macro
PLL 2.5V
IC4022
SELMAIN
VMYS
TPA59
TPA39
TPA030
SDA1
SCL1
TO CONV & MPU_RESET
CLK
RST
V_SYNC



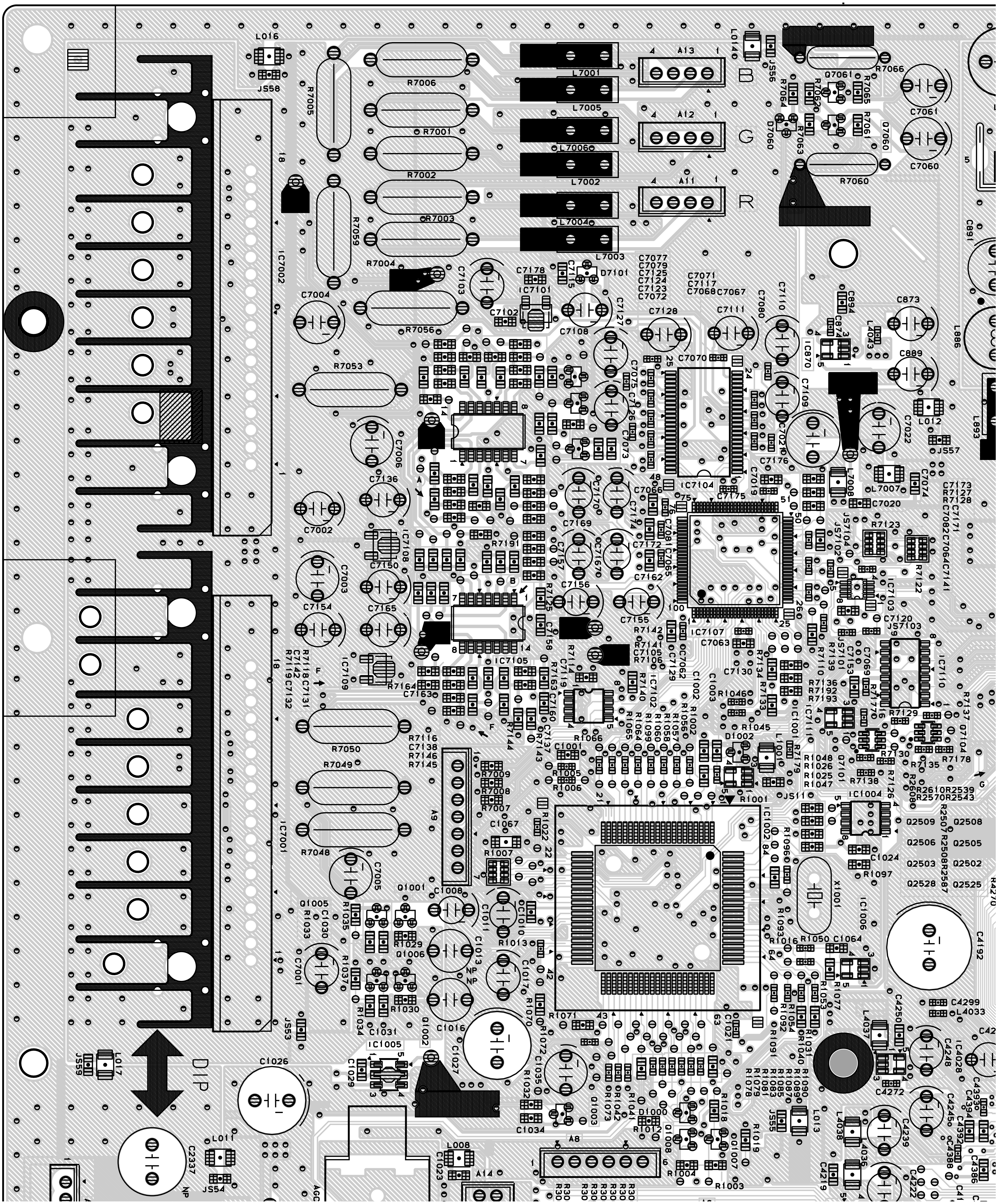
ver.2_for_Main_processor
Global_tvsiginal_processing_CoreLSI
GC2M
IC4011
(79) (96) (102)
IIC1 < SLAVE > 88 / 8A
AD Macro
DA Macro
AD Macro
XTAL
Macro
For BurstLock
PLL
Macro
For Mid_CLK
PLL
Macro
For FBP
PLL
Macro
SIDE_BLK Control
ACL_SW
IC4017
IN
SW
OUT
Vadj
GND
FROM
CHOPPER 2.5V
Q4518
Q4024
Q4025
Q4027
Q4021
Q4022
Q4023
Q4039
PB
PR
Y
SYSCLK=20MHz
X4003
L4018
410mA(HD)
BOUT
GOUT
ROUT
ABL
ACL_SW
H-DRV
H-OUT
CONV
(MPU)
OSDCNT
BLK
V_MUTE
V-OUT
RST
SUB_PB
SUB_PR
SUB_Y
PLL 2.5V
IC4022
Vin
Vo
GND
ON/OFF
Nr
GC2S-AD-GND
IC4017(2.5V-REG)
L4056


IC4020
IC4021
IC4027
IC4023
IC4024
IC4030
IC4019
IC4015
IC4018
IC4025
IC4026
GC2S
IIC1 < SLAVE > 28 / 26
16M SGRAM
Macro PLL For Mid_CLK
Macro PLL For SGRAM
Macro XTAL
AD Macro
DA
(91) (105) (111)
FROM CHOPPER 5V
92mA (HD)
8mA (HD)
70mA (DW)
118mA (HD)
BLK
HCLP
VM
ROUT
GOUT
BOUT
RCF
GCF
BCF
RDV
BDV
ABL
OSDCNT
TPA40
WE
CAS
RAS
P7-0022
Q2527
Q2526
Q2529
3.3V
2.5V
5V


IC4023
IC4024
IC4019
IC4015
IC4025
16M SGRAM
Q931
Q932
Q933
Q2501
Q2502
Q2503
Q2504
Q2505
Q2506
Q2507
Q2508
Q2509
Q2510
Q2522
Q2525
Q2526
Q2527
Q2528
Q2529
B-SLICE
A15
LG1
GND
B
GND
R
GND
G
GND
GND
VM
GND (VM)
S-ABL
12V
18V
3.3V
9V
VM
S-ABL
TPA006
TPA005
TPA43
TPA44
TPA45
TP087
TP061
TP071
JS29
JS4008
JS4010
L931 10
L4024 10
L4025 10
L4026 10
L2501 10
L2502 10
L4042 10
118mA (HD)
R4171 0
R4170 150
R4172 0
R4173 0
R4174 1.0k 1%
R4175 47 1%
R4176 2.7k
C4081 16V 1
C4083 16V 100
R4207 33k
R4208 22k
C4300 0.1
C4180 0.01
C4181 16V 100
C4141 0.01
C4142 16V 100
C4176 16V 0.1
C4177 16V 0.1
C4178 16V 0.1
C4179 16V 0.1
R4177 0
R4197 100
C4140 16V 1
C4143 0.01
R4147 0
R4148 0
R4149 0
R4158 150
R4289 3.3k
R4159 150
R4146 150
R4163 82k 1%
R4166 82k 1%
C4157 0.01
C4160 0.01
R4164 13k 1%
R4168 13k 1%
R4074 240 1%
R4075 75 1%
R4076 240 1%
R4078 75 1%
R4079 240 1%
R4080 240 1%
R4081 150
R4082 75 1%
R4083 150
R4084 240 1%
R4085 75 1%
R4086 150
R4087 240 1%
R4088 75 1%
R4089 75 1%
C4331 0.1
C4170 16V 100
C4169 0.01
C4172 0.01
C4173 16V 100
C4164 16V 0.1
R4178 0
C4165 16V 1
C4166 16V 1
C4167 16V 1
R4183 100
R4184 100
R4153 150
R4154 150
OSDR
OSDG
OSDB
OSDYS
OSDYM
Rin
COF-R
Gin
COF-G
Bin
COF-B
BLK
CLP
Drv-R
Drv-B
CONTRAST
GND
9v
ROUT
OUTPUT9v
GOUT
BrightS/H
BOUT
SPOTkiller
(x 4.3) OSD-Rin
(x 4.3) OSD-Gin
(x 4.3) OSD-Bin
YS
YM
Rin (x 6.4)
Gin (x 6.4)
Bin (x 6.4)
OSD-Rin
OSD-Gin
OSD-Bin
C931 50V 100
C936 0.01
R934 15k
R932 39k
R936 1.0k
R939 47
R930 10
R935 4.7k
C933 16V 100
C935 1000p
R931 100
C932 0.01
R933 4.7k
R937 150
R938 120
R940 1k
R927 1k
R2578 10
R2580 220
R2583 180
R2501 270 1%
R2502 470 1%
R2503 470 1%
R2505 33 1%
R2504 220 5%
R2542 1200
R2538 1200
R2577 0
R2519 10
R2584 10
R2587 220
R2590 180
R2509 270 1%
R2506 33 1%
R2507 220
R2508 470 1%
R2510 470 1%
R2543 1200
R2539 1200
R2570 10
R2608 0
R2524 6.8k
C2587 0.01
C2588 16V 1000
R2571 10
R2573 220
R2576 180
R2511 270 1%
R2512 470 1%
R2513 33 1%
R2514 470 1%
R2515 220
C2513 16V 0.1
C2507 16V 100
R2541 1200
R2537 1200
R2520 10
R2579 0
R2567 0
R2568 6.8k 1%
R2569 8.2k 1%
C2518 16V 1
P7-0022
R4261 22
C4407 0.1
C4409 0.1
C4418 0.1
C4406 0.1
C4419 0.1
C4420 0.1
C4408 0.1
C4410 0.1
C4411 0.1
C4412 0.1
C4413 0.1
C4414 0.1
C4421 0.1
R4263
R4264
R4265
R4266
R4267
R4268
R4269
R4270
C4280 0.01
C4282 16V 1
C4283 10V 470
C4285 16V 1
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
RAS
CAS
WE
CLK
DQM1
DQM3
MCH
VCCQ
VSSQ
VCC
VSS
NC/A10
NC/CS1#
DSF
CKE
/CAS
/WE
DQM2
DQM0
/CS
/RAS
DQ0
DQ1
DQ2
DQ3
DQ4
DQ5
DQ6
DQ7
DQ8
DQ9
DQ10
DQ11
DQ12
DQ13
DQ14
DQ15
DQ16
DQ17
DQ18
DQ19
DQ20
DQ21
DQ22
DQ23
DQ24
DQ25
DQ26
DQ27
DQ28
DQ29
DQ30
DQ31



Board section



L016
JS58
R7005
R7006
R7001
R7002
R7003
R7004
R7059
IC7002
L7001
L7005
L7006
L7002
L7004
L7003
A13
A12
A11
B
G
R
L0140
JS56
Q7061
R7066
R7064
R7062
R7065
R7063
R7061
D7060
Q7060
C7061
C7060
R7060
C891
C7004
R7056
C7103
C7178
IC7101
C7102
C7108
D7101
C7077
C7079
C7125
C7124
C7123
C7072
C7071
C7117
C7068
C7067
C7128
C7111
C7080
C7110
C894
C874
L4043
C873
L886
C889
IC870
C7070
IC7104
R7053
C7006
C7109
C7021
C7022
L012
JS57
L893
C7136
C7002
IC7108
C7150
C7003
C7154
C7165
R7191
C7169
C7170
C7174
C7172
C7167
C7066
C7175
C7176
L7008
L7007
C7074
C7020
C7173
C7127
C7171
R7123
C7082
C7064
C7141
R7122
IC7103
JS7103
C7120
C7156
C7155
C7162
IC7107
C7063
R7142
R7141
C7105
R7106
C7062
C7129
IC7105
R7164
C7163
C7118
C7131
R7119
C7132
C7142
IC7109
C7130
R7134
R7133
C1002
C1003
R1002
R1046
R1045
IC7110
R7136
R7192
R7193
R7129
R7137
Q7104
R7178
IC7111
D1002
L1001
R7179
R1048
R1026
R1025
R1047
R7138
R7135
R7130
R7126
R2508
R2610
R2539
R2570
R2543
IC1004
R7050
R7049
R7048
R7116
C7138
R7146
R7145
A9
R7009
R7008
R7007
C1001
R1005
R1006
R1066
R1001
JS11
IC1002
R1022
C1067
R1007
Q2509
Q2508
Q2506
Q2505
Q2503
Q2502
Q2528
Q2525
R2507
R2508
R2587
C1024
R1097
X1001
IC1006
C4192
C7005
Q1001
Q1005
R1033
C1030
R1035
C1008
C1011
C1010
R1029
Q1006
C1013
R1013
C1017
C7001
IC7001
R1037
R1030
R1034
C1031
Q1002
C1016
NP
R1070
R1072
R1071
C1035
R1032
R1016
R1050
C1064
R1053
R1077
R1054
R1092
R1091
R1031
R1040
R1089
R1090
R1087
R1081
R1083
R1078
R1079
C4250
L4037
L4033
C4299
C4248
IC4028
C4272
JS53
JS59
L017
DIP
C1026
C1029
IC1005
C1027
C1034
Q1003
R1073
R1042
R1041
D1000
R1012
Q1008
R1018
R1019
Q1007
JS55
L013
L4038
C4239
C4245
C4394
C4393
C4392
C4388
C4386
L4036
C4219
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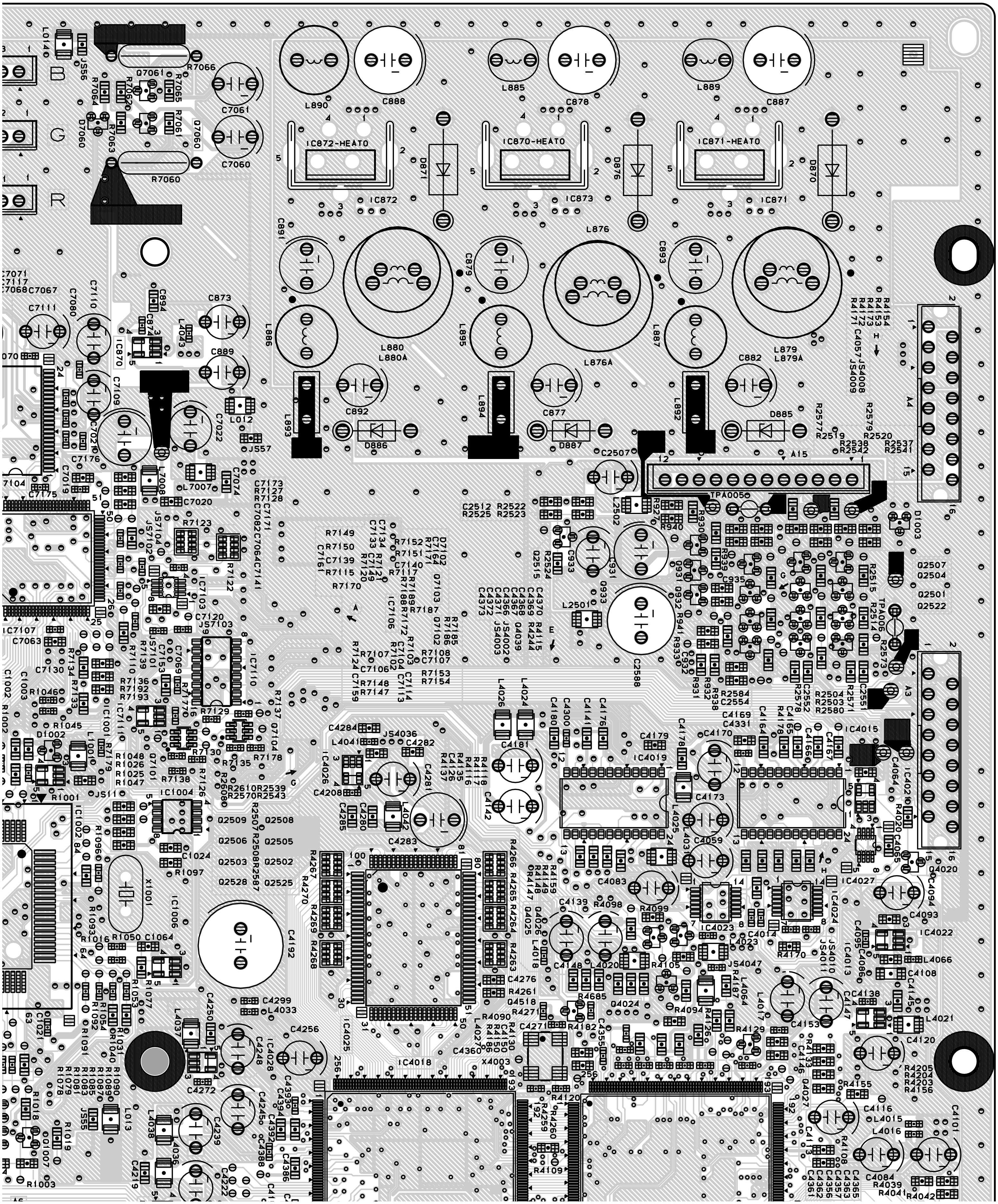
C2337
JS54
NP
AGC
L008
C1023
A14
A8
R1004
R1003
R30


B
G
R
L014
JS56
Q7061
R7066
R7065
R7064
R7061
D7060
R7063
R7060
C7061
C7060
L890
C888
L885
C878
L889
C887
IC872-HEATO
IC870-HEATO
IC871-HEATO
IC872
IC873
IC871
D871
D876
D870
L876
C891
C879
C893
L886
L880
L880A
L895
L876A
L887
L879
L879A
C882
C873
C889
C894
C874
L4043
IC870
L012
C7022
JS57
L893
C892
D886
L894
C877
D887
L892
D885
C2507
A15
TPA005
A4
A3
R4154
R4153
R4172
R4173
R4171
C4057
JS4008
JS4009
R2577
R2579
R2519
R2520
R2538
R2542
R2537
R2541
D1003
Q2507
Q2504
Q2501
Q2522
TPA006
C2588
L2501
L2502
C933
C931
Q933
C935
R940
R2515
R2514
R2573
R2584
C2554
R2504
R2503
R2580
C4169
C4331
IC4015
C4064
C4021
IC4019
C4179
C4181
C4142
C4170
C4173
C4059
C4083
IC4027
Q4020
C4094
C4093
IC4022
L4066
C4108
C4138
C4147
C4153
L4021
C4120
R4205
R4204
R4203
R4156
R4155
C4116
L4015
L4016
C4101
C4084
R4039
R4041
R4042
IC4023
JS4047
R4170
L4017
L4064
R4129
R4126
R4094
R4685
Q4024
R4182
C4355
C4271
C4360
X4003
R4120
R4109
IC4018
IC4025
C4256
C4248
IC4028
C4272
C4239
L4037
C4250
C4299
L4033
C4192
C4283
C4284
JS4036
L4041
C4282
IC4026
C4208
C4281
L4042
C4285
C4276
R4261
Q4518
R4271
R4090
C4148
L4020
C4139
R4098
R4099
R4105
IC7110
IC7103
IC7107
C7063
C7130
R7134
R7133
R7136
R7192
R7193
IC7111
IC1001
R1045
D1002
L1001
R1048
R1026
R1025
R1047
R7138
R7135
R7129
R7178
R7137
R7179
R1001
JS11
IC1004
C1024
R1097
X1001
IC1006
IC1002
R1096
R1093
R1016
R1050
C1064
R1053
R1077
R1054
R1092
R1091
R1031
R1040
C1027
R1079
R1078
R1081
R1085
R1080
R1089
R1090
R1018
JS55
L013
R1019
Q1007
R1003
L4038
L4036
C4219
C4222
C1002
R1002
C1003
R1046
C7104
C7175
C7176
C7019
C7021
C7109
C7111
C7110
C7080
C7067
C7071
C7117
C7068
C7070
L7008
L7007
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C7082
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C7141
R7123
JS7104
JS7102
R7122
C7120
JS7103
R7110
R7139
JS7101
C7153
C7069
R7170
R7149
R7150
C7161
C7139
R7115
C7134
C7133
R7152
R7151
C7140
R7117
C7164
D7102
D7103
R7189
R7188
R7187
IC7106
R7172
R7185
R7186
Q7102
R7108
C7107
R7153
R7154
R7107
C7106
C7113
C7114
R7124
C7159
R7148
R7147
Q2509
Q2508
Q2506
Q2505
Q2503
Q2502
Q2528
Q2525
R2507
R2508
R2587
R2610
R2539
R2570
R2543
C2512
R2522
C2525
R2523
Q2516
R2524
C4370
C4369
C4368
C4367
C4366
C4371
C4372
C4373
JS4002
JS4003
Q4039
R4115
R4244
L4026
L4024
C4180
C4300
C4141
C4176
C4178
C4164
R4178
C4165
C4166
C4167
R4135
R4116
R4117
R4119
C4126
R4137
R4267
R4270
R4269
R4268
R4266
R4265
R4264
R4263
R4186
R4150
R4130
L4027
R4259
R4260
C4386
C4388
C4392
C4394
C4245
L4018
L4025
L4031
C4113
C4146
Q4027
R4108
C4363
C4357
C4356
C4362
C4361
C4365
C4095
C4086
IC4013
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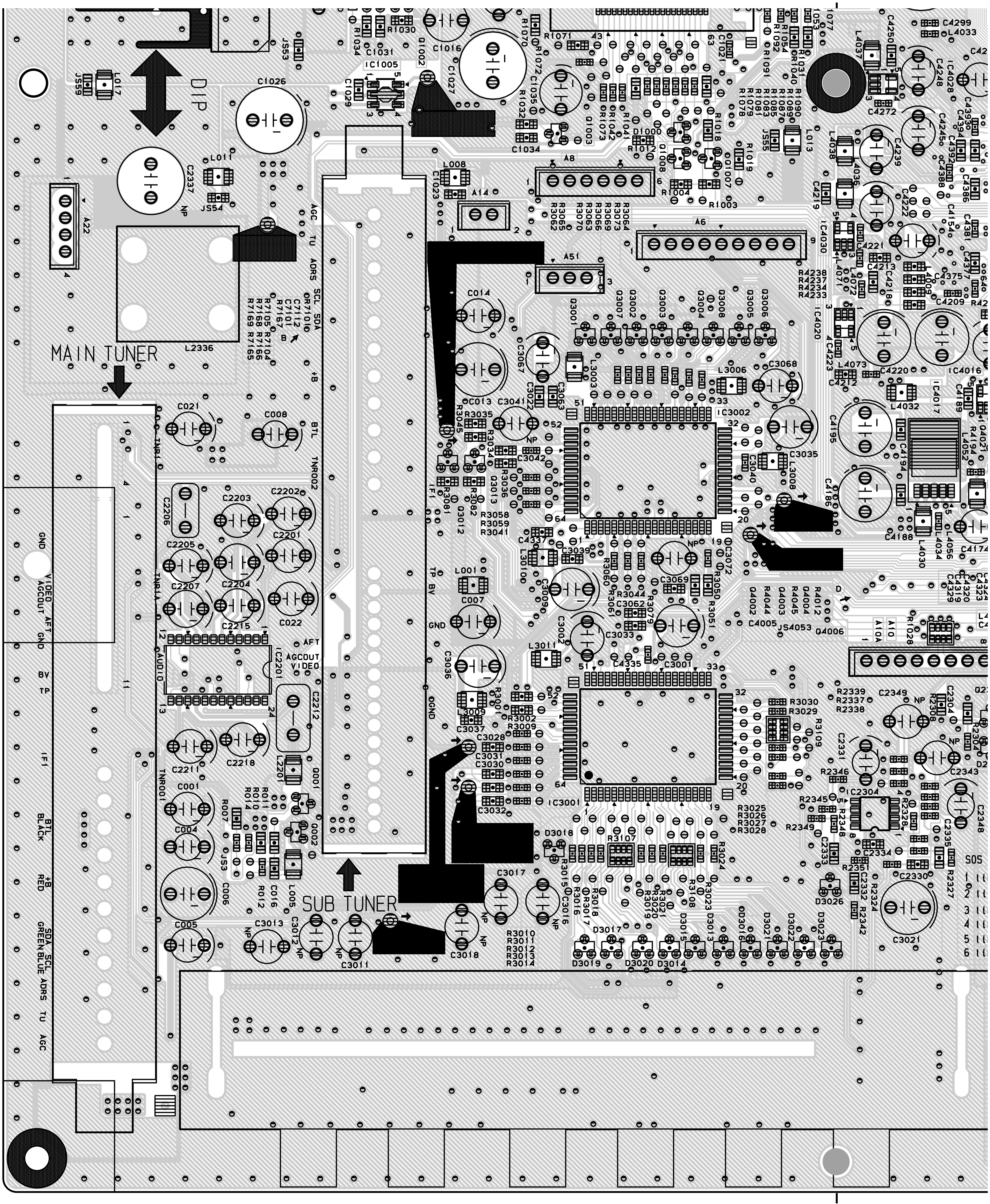
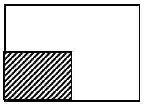
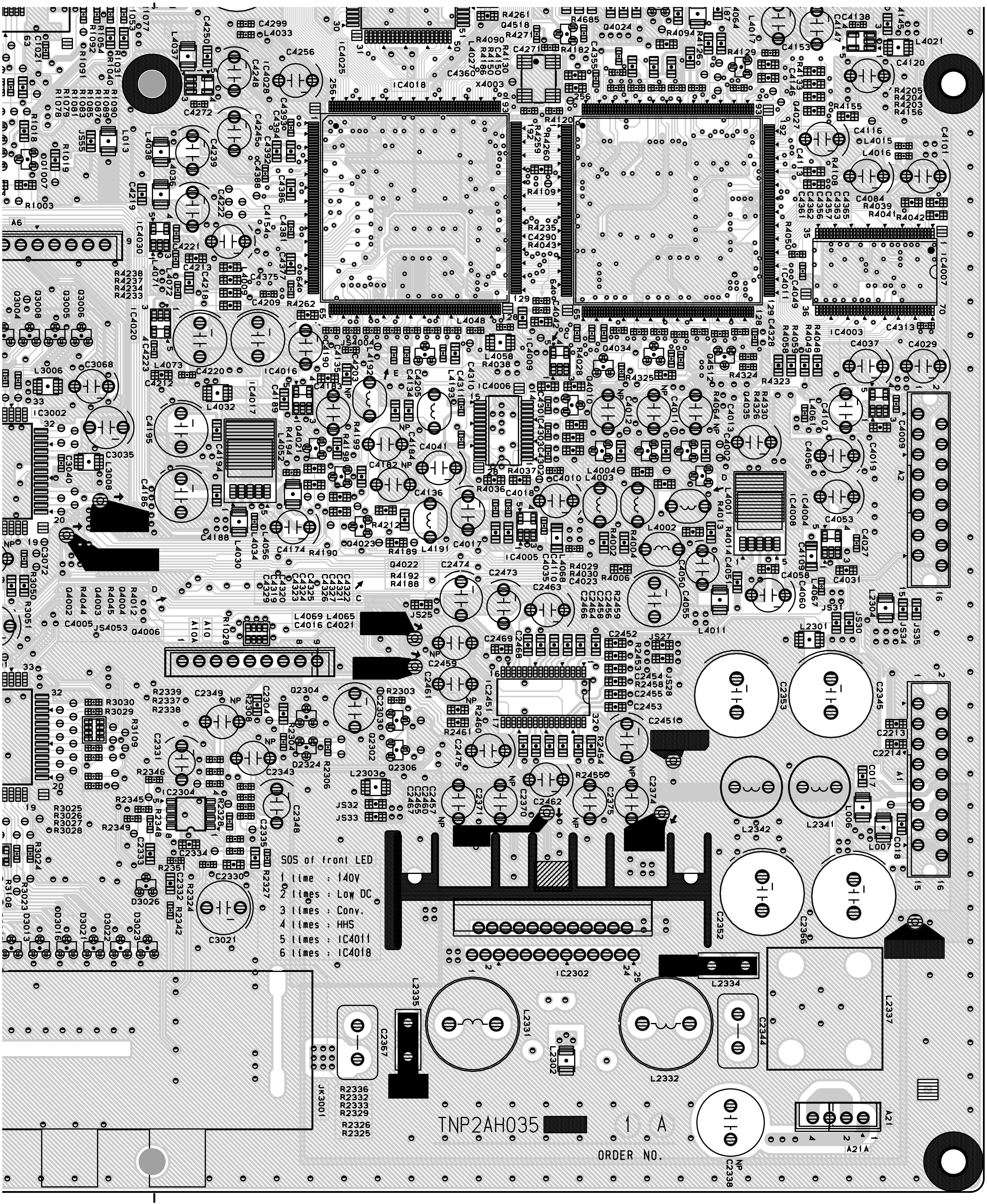
JS4010
JS4011
L4023
C4014
C4065
R4020
C4145


DIP
MAIN TUNER
SUB TUNER
A22
A8
A6
A14
A51
IC1005
IC3002
IC3001
IC2201
IC2304
IC4030
IC4020
IC4016
IC4017
C1026
C2337
L2336
L2201
L3011
L3009
L001
GND
VIDEO
AGCOUT
AFT
BV
TP
IF1
BTL
BLACK
+B
RED
SDA
SCL
GREEN
BLUE
ADRS
TU
AGC
NP
SOS

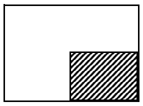


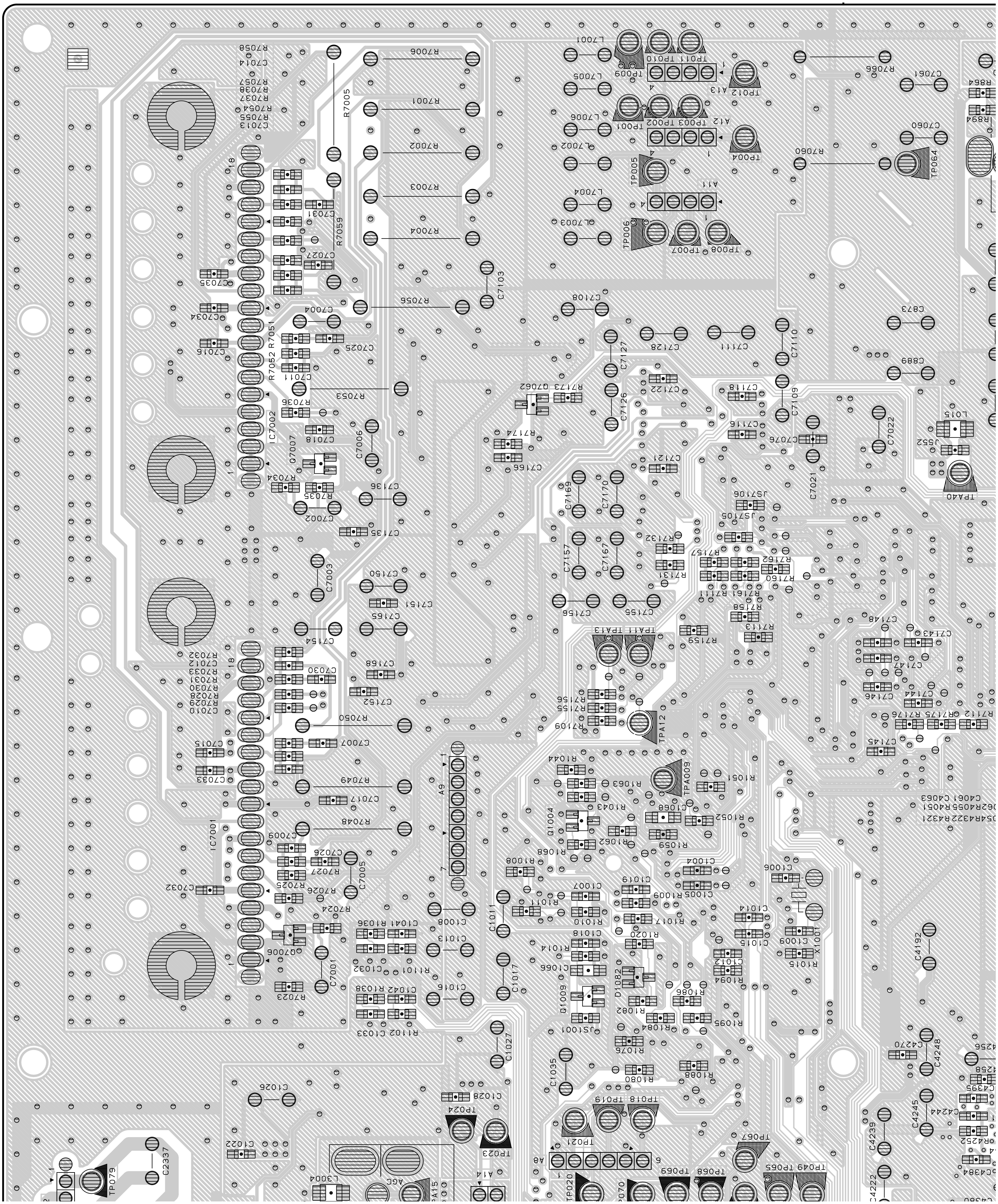
Board section

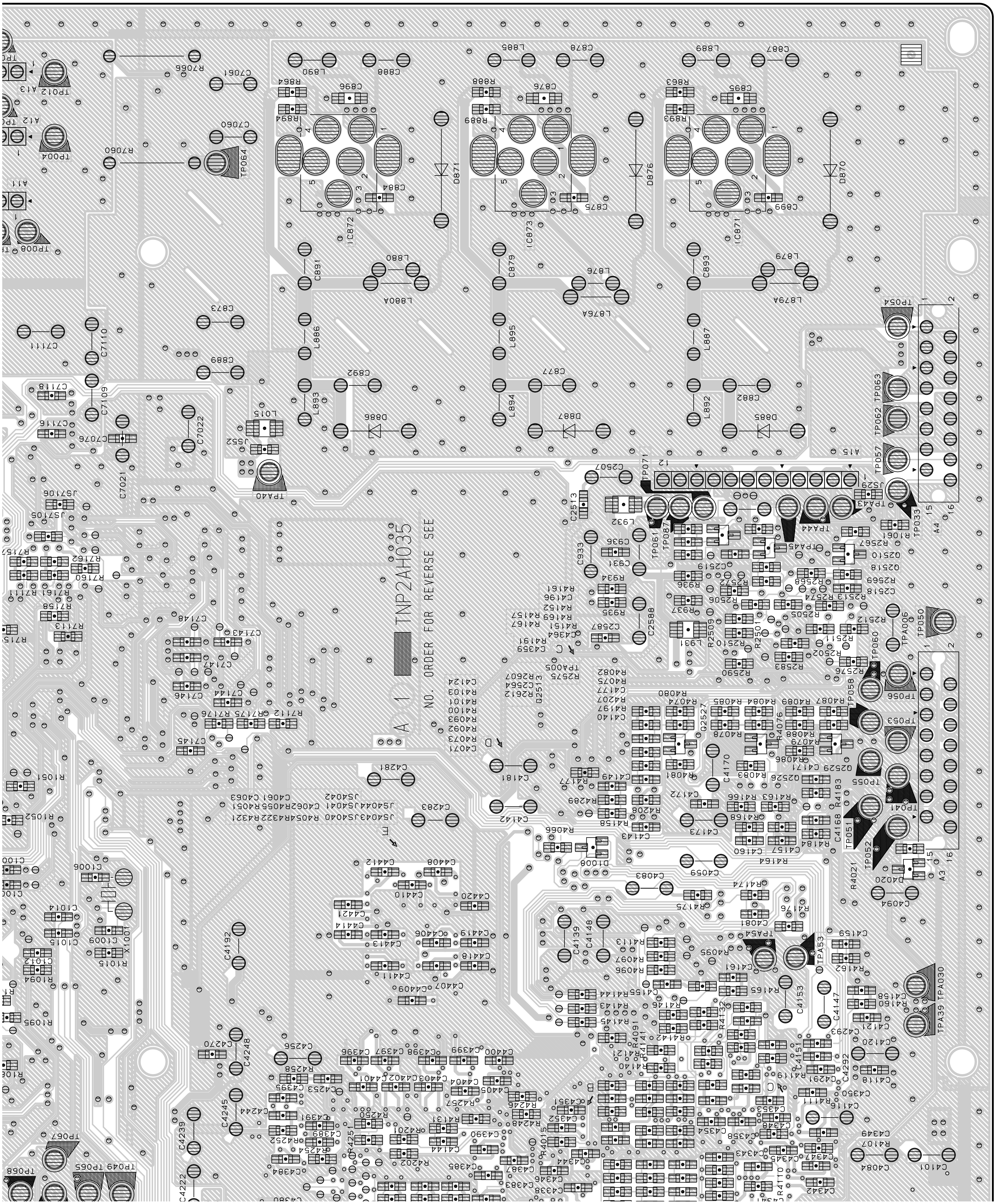

IC4018
IC4011
IC4003
IC4007
IC4025
IC4006
IC4016
IC4017
IC4020
IC4030
IC3002
IC2304
IC2302
IC2451
IC4005
IC4008
IC4004
IC4009
A2
A1
A6
A10
A21
A21A
JK3001
C2353
C2345
C2352
C2366
C2338
C2344
C2367
L2331
L2332
L2334
L2335
L2337
L2341
L2342
L2302
TNP2AH035
1 A
ORDER NO.

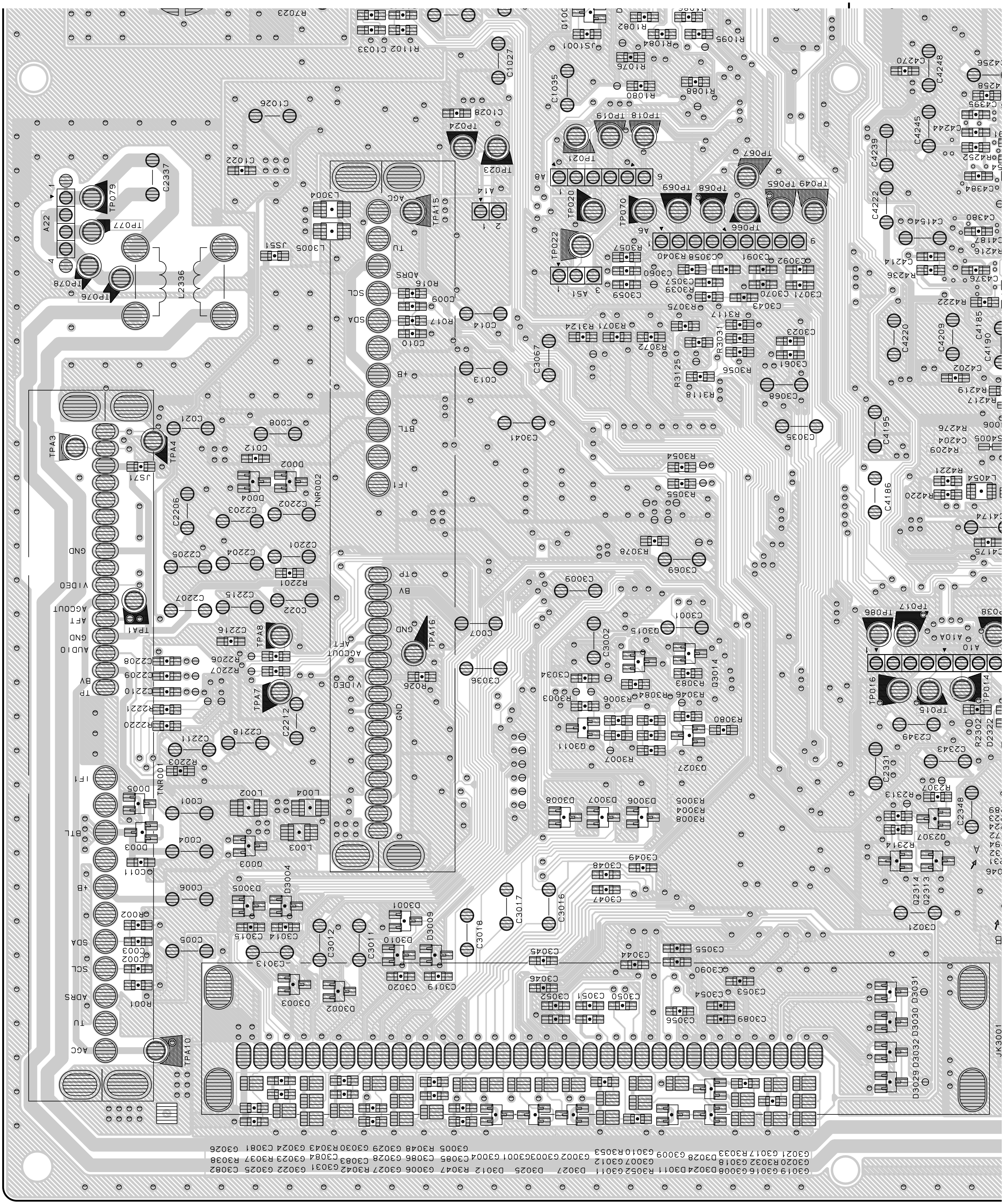
SOS of front LED
1 time : 140V
2 times : Low DC
3 times : Conv.
4 times : HHS
5 times : IC4011
6 times : IC4018

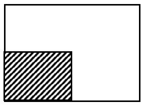
Board section






TNP2AH035
NO. ORDER FOR REVERSE SEE
A 1
IC871
IC872
IC873
D870
D871
D876
L879
L880
L876
JS529
TPA006
TP050
TP054
TP063
TP062
TP057
TP033
TPA030
TPA39
TPA53
TPA54
TP041
TP051
TP052
TP053
TP055
TP056
TP058
TP060
TP064
TP067
TP065
TP068
TP049
TP040

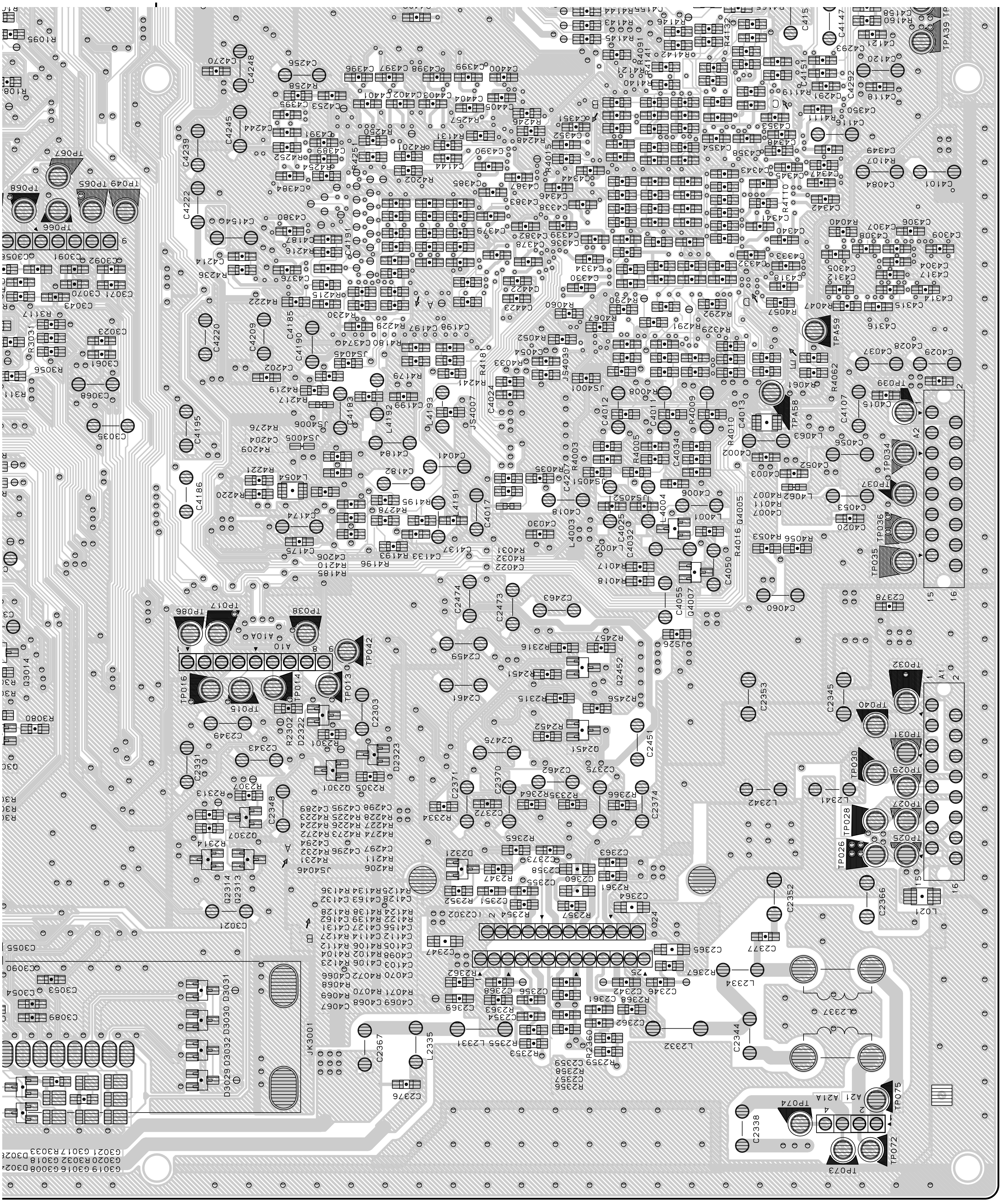




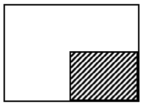
Board section

Bottom A-Board Layout

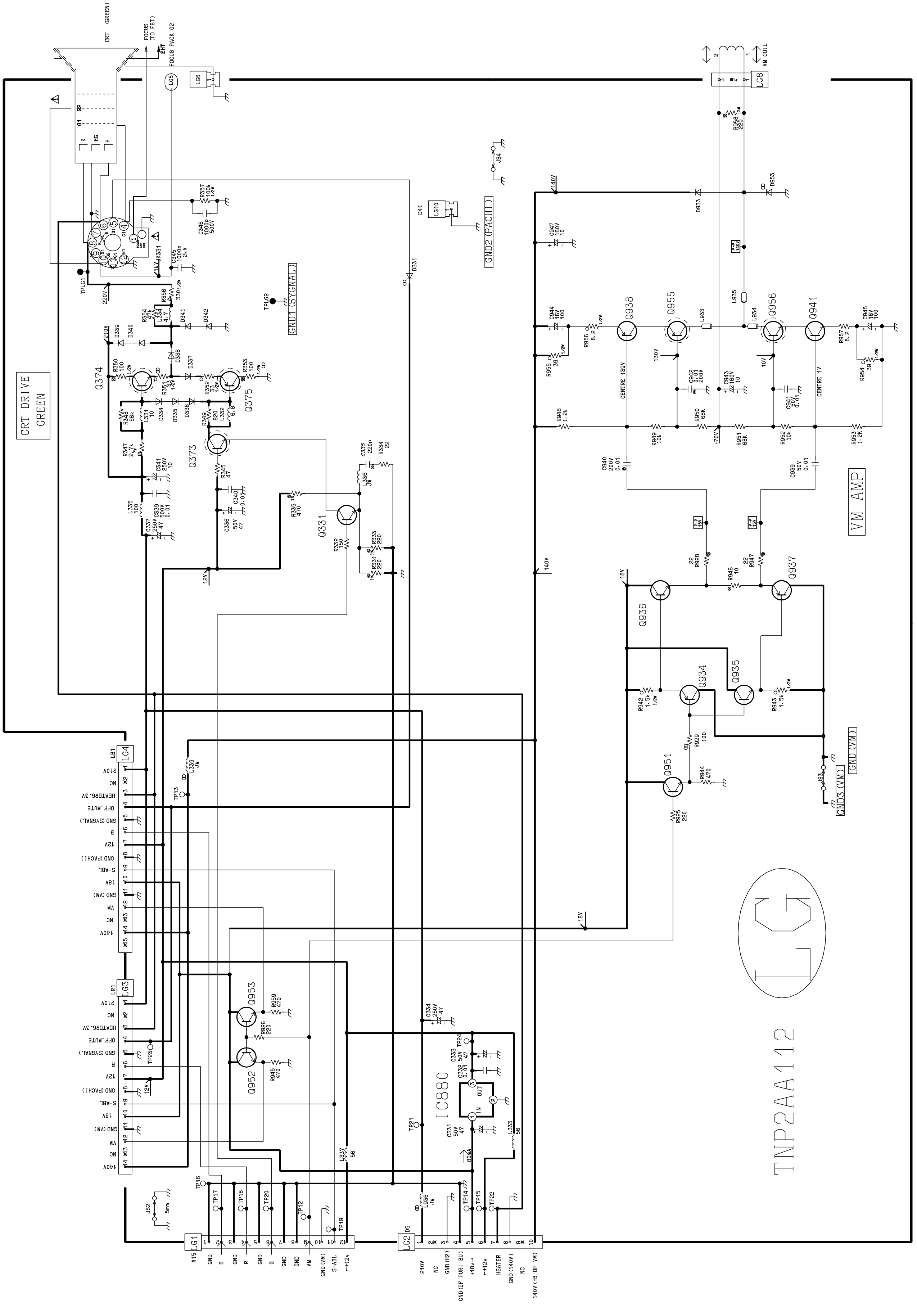
Bottom left portion



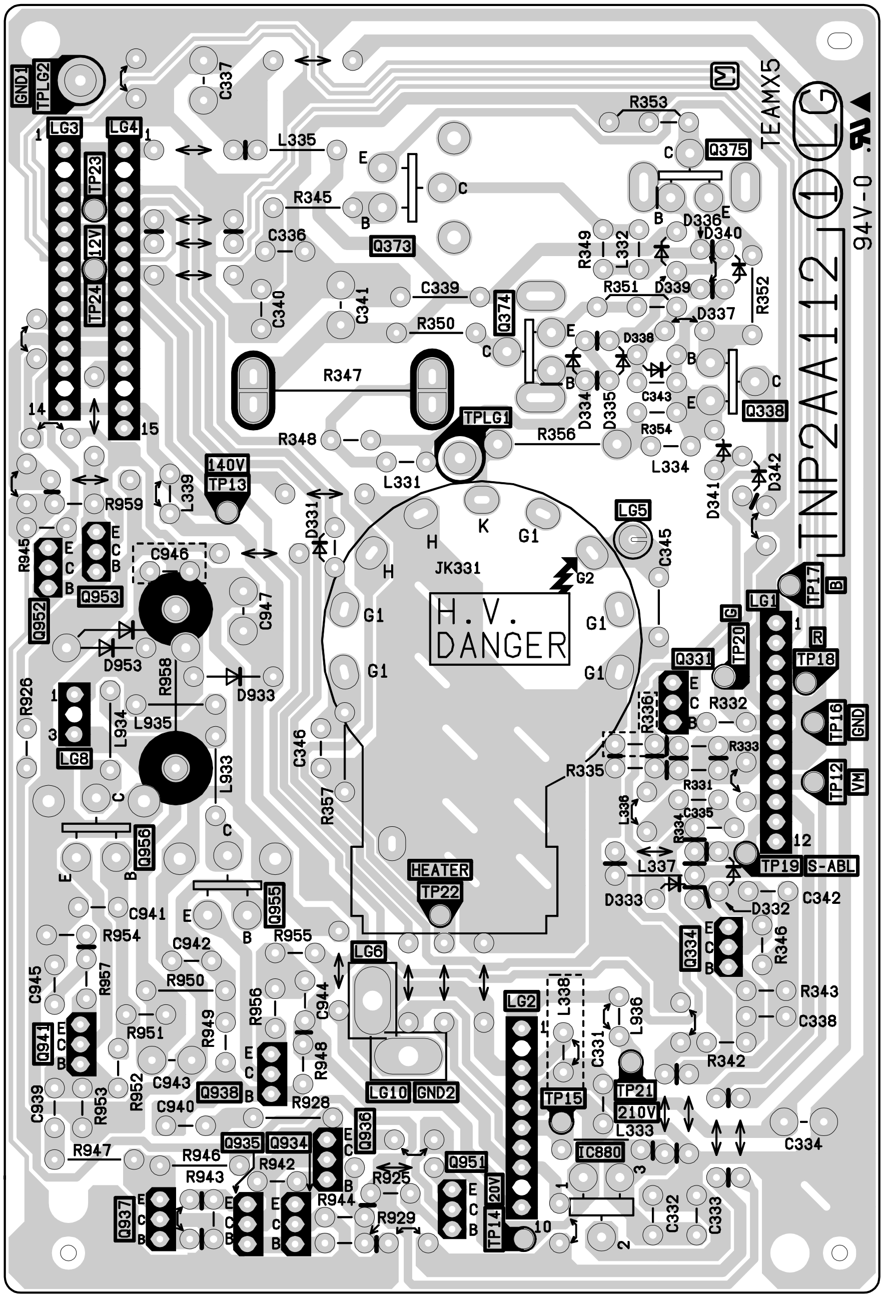
Board section



LG-Board schematic - TNP2AA112


CRT (GREEN)
FOCUS (TO FBT)
FOCUS PACK G2
VM COIL
CRT DRIVE GREEN
GND1 (SYGNAL)
GND2 (PACHI)
GND3 (VM)
GND (VM)
VM AMP
LG
TNP2AA112
Q374
Q375
Q373
Q331
Q938
Q955
Q956
Q941
Q936
Q937
Q934
Q935
Q951
Q953
Q952
IC880
LG1
LG2
LG3
LG4
LG5
LG6
LG8
LG10
140V
18V
12V
210V
NC
HEATER6.3V
OFF_MUTE
GND (SYGNAL)
B
R
G
GND (PACHI)
S-ABL
VM
GND (VM)
140V (+B OF VM)
HEATER
CENTRE 139V
CENTRE 1V

LG-Board layout - TNP2AA112


GND1
TPLG2
C337
LG3
LG4
TP23
12V
TP24
L335
R345
C336
Q373
C339
C340
C341
Q374
R350
R347
R348
TPLG1
R356
L331
140V
TP13
L339
R959
R945
Q952
Q953
C946
D953
R958
D933
C947
D931
JK331
H.V.
DANGER
HEATER
TP22
R926
LG8
L934
L935
L933
C346
R357
Q956
Q955
C941
R954
C942
R955
C945
R957
R950
Q941
R951
R949
R956
C944
R948
LG6
LG10
GND2
C939
R953
R952
C943
C940
Q938
R928
R947
R946
R943
Q935
Q934
R942
Q936
R925
R944
R929
Q937
Q951
20V
TP14
LG2
L338
L936
C331
TP15
TP21
210V
L333
IC880
C332
C333
C334
R353
Q375
TEAMX5
LG
94V-0
TNP2AA112
R349
L332
D336
D340
R351
D339
R352
D337
D338
D334
D335
C343
Q338
R354
L334
D342
D341
LG5
C345
TP17
LG1
TP20
TP18
Q331
R336
R332
TP16
GND
R333
R335
R331
TP12
VM
L336
C335
R334
L337
TP19
S-ABL
D333
D332
C342
Q334
R346
R343
C338
R342

LG-Board - TNP2AA112

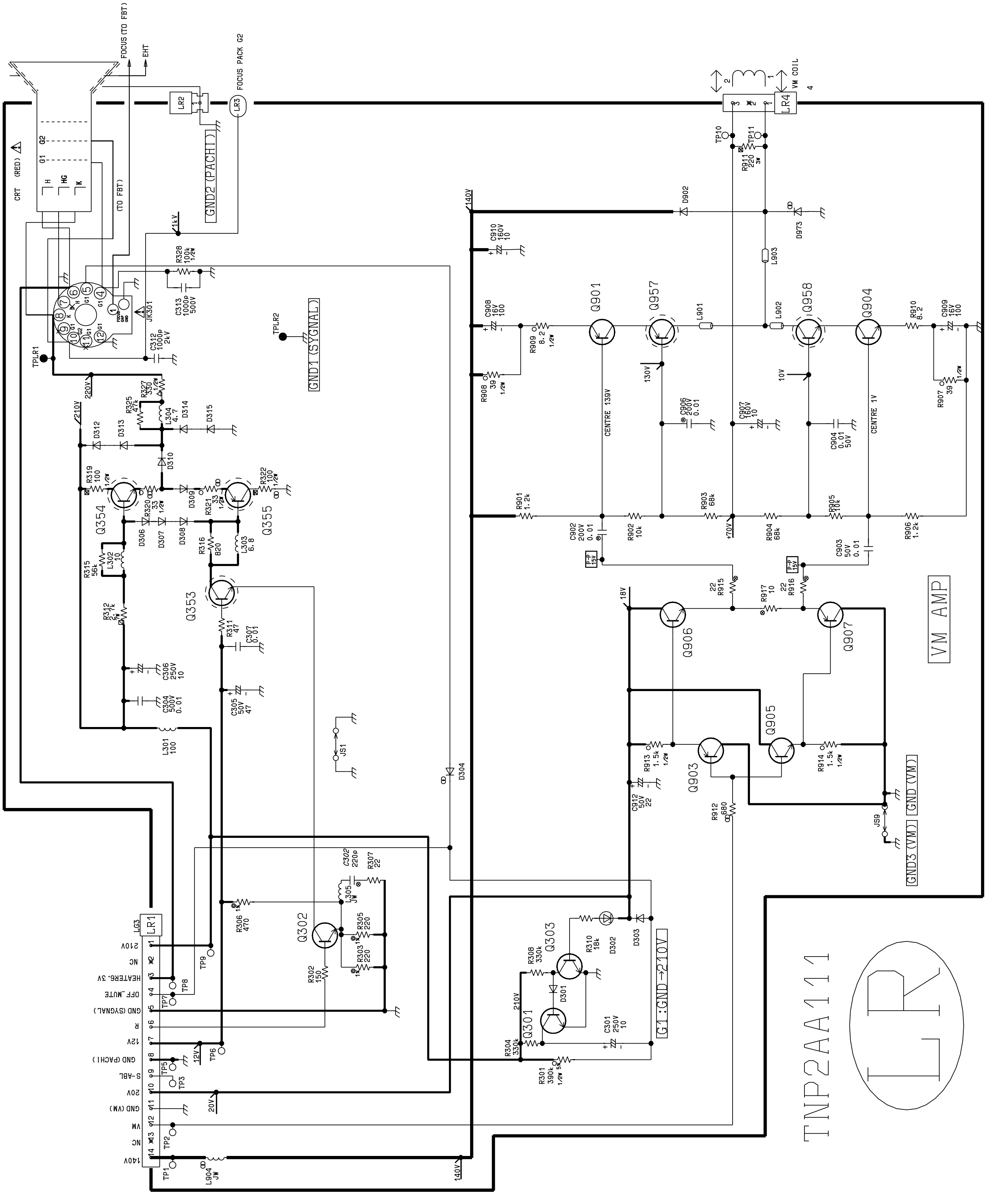
	Q331	Q373	Q374	Q375	Q934	Q935	Q936
B	4.05	11.98	172.90	171.50	9.08	9.08	9.68
C	11.61	171.40	218.60	0.43	0.00	18.91	18.91
E	3.85	11.64	172.40	172.10	9.68	8.49	9.11

	Q937	Q938	Q941	Q951	Q952	Q953	Q955
B	2.47	137.80	0.98	9.67	9.65	9.66	129.50
C	0.00	130.10	9.12	18.91	18.91	18.91	71.80
E	9.09	138.40	0.38	9.07	9.09	9.09	130.10

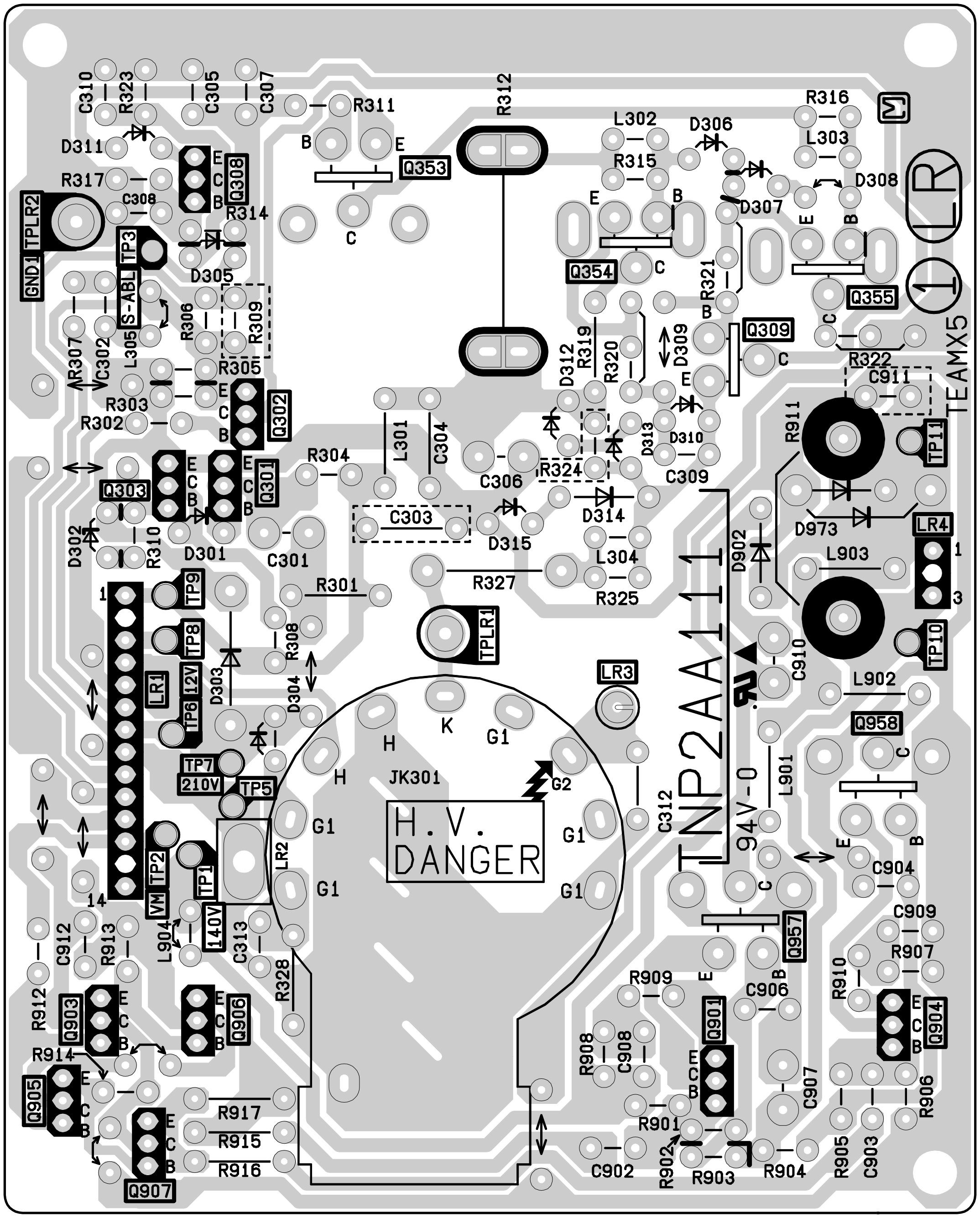
	Q956
B	9.69
C	71.80
E	9.12

LG - Board integrated circuit TNP2AA112

IC880	
1	18.91
2	GND
3	11.99


FOCUS (TO FBT)
EHT
FOCUS PACK G2
CRT (RED)
(TO FBT)
GND2 (PACH1)
GND1 (SYGNAL)
LR2
LR3
LR4
VM COIL
TP10
TP11
R911 220 3W
D902
D973
L903
140V
C910 160V 10
C908 16V 100
R909 8.2 1/2W
R908 39 1/2W
Q901
Q957
L901
L902
Q958
Q904
R910 8.2
C909 16V 100
R907 39 1/2W
130V
10V
CENTRE 139V
CENTRE 1V
C906 200V 0.01
C907 160V 10
C904 0.01 50V
R901 1.2k
R902 10k
R903 68k
R904 68k
R905 10k
R906 1.2k
C902 200V 0.01
C903 50V 0.01
+70V
18V
R915 22
R917 10
R916 22
Q906
Q907
Q905
Q903
R913 1.5k 1/2W
R914 1.5k 1/2W
C912 50V 22
R912 680
JS9
GND (VM)
GND3 (VM)
VM AMP
1kV
R328 100k 1/2W
C313 1000P 500V
JK301
C312 1000P 2kV
TPLR1
TPLR2
220V
210V
R327 330 1/2W
R325 47k
L304 4.7
D314
D315
D312
D313
D310
R319 100 1/2W
R320 33 1/2W
D309
R321 33 1/2W
R322 100 1/2W
Q354
Q355
D306
D307
D308
R316 820
L303 6.8
R315 56k
L302 10
Q353
R312 2.7k
R311 47
C307 0.01
C306 250V 10
C304 500V 0.01
C305 50V 47
L301 100
JS1
D304
LG3
LR1
210V
NC
HEATERS, 3V
OFF_MUTE
GND (SYGNAL)
R
12V
GND (PACH1)
S-ABL
20V
GND (VM)
VM
NC
140V
TP1
TP2
TP3
TP5
TP6
TP7
TP8
TP9
L904 JW
C302 220P
R307 22
L305 JW
R306 470
Q302
R305 220
R303 220
R302 150
R308 330k
Q303
R310 18k
D302
D303
D301
Q301
R304 330k
R301 390k 1/2W
C301 250V 10
G1:GND→210V
TNP2AA111
LR

LR-Board schematic - TNP2AA111

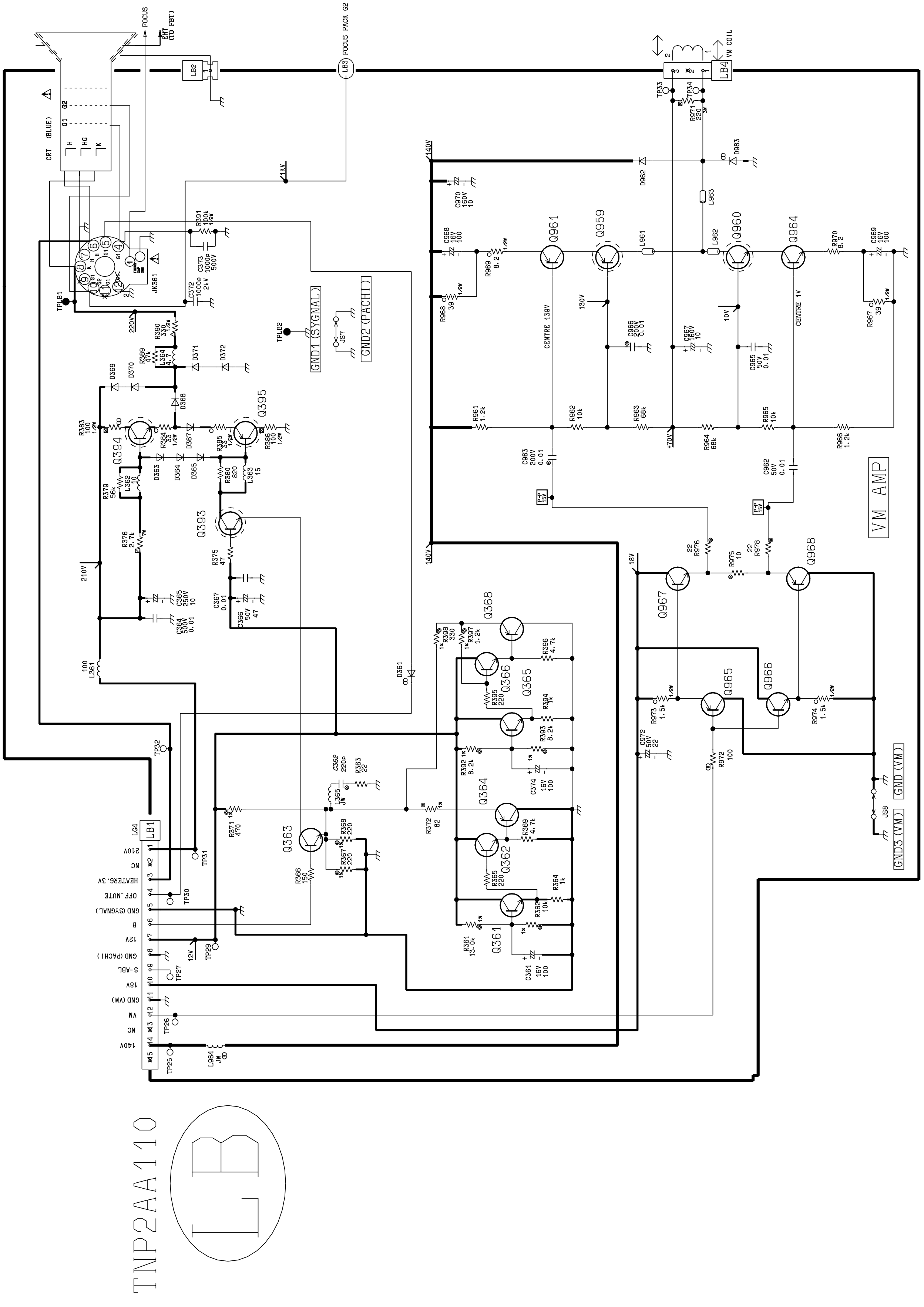


C310
R323
C305
C307
R311
R312
R316
L302
D306
L303
D311
R315
D308
R317
Q308
Q353
D307
C308
R314
TPLR2
TP3
Q354
R321
Q355
GND1
S-ABL
D305
R306
R309
L305
C302
R307
R305
Q309
D312
R319
R320
D309
R322
C911
TEAMX5
R303
R302
Q302
L301
C304
D313
D310
R911
TP11
R304
C306
R324
C309
Q303
Q301
C303
D314
D973
LR4
D302
R310
D301
C301
D315
L304
D902
L903
R301
R327
R325
TP9
TPLR1
TP8
R308
C910
TP10
LR1
12V
TP6
D303
D304
LR3
L902
Q958
H
K
G1
TNP2AA111
JK301
TP7
210V
TP5
G2
L901
H.V.
DANGER
C312
94V-0
TP2
TP1
VM
LR2
C904
140V
L904
C313
C909
C912
R913
Q957
R907
R909
R910
R912
Q903
Q906
R328
C906
Q901
Q904
R908
C908
R914
C907
R906
Q905
R917
R901
Q907
R915
R916
C902
R902
R903
R904
R905
C903
E
C
B
1
3
14

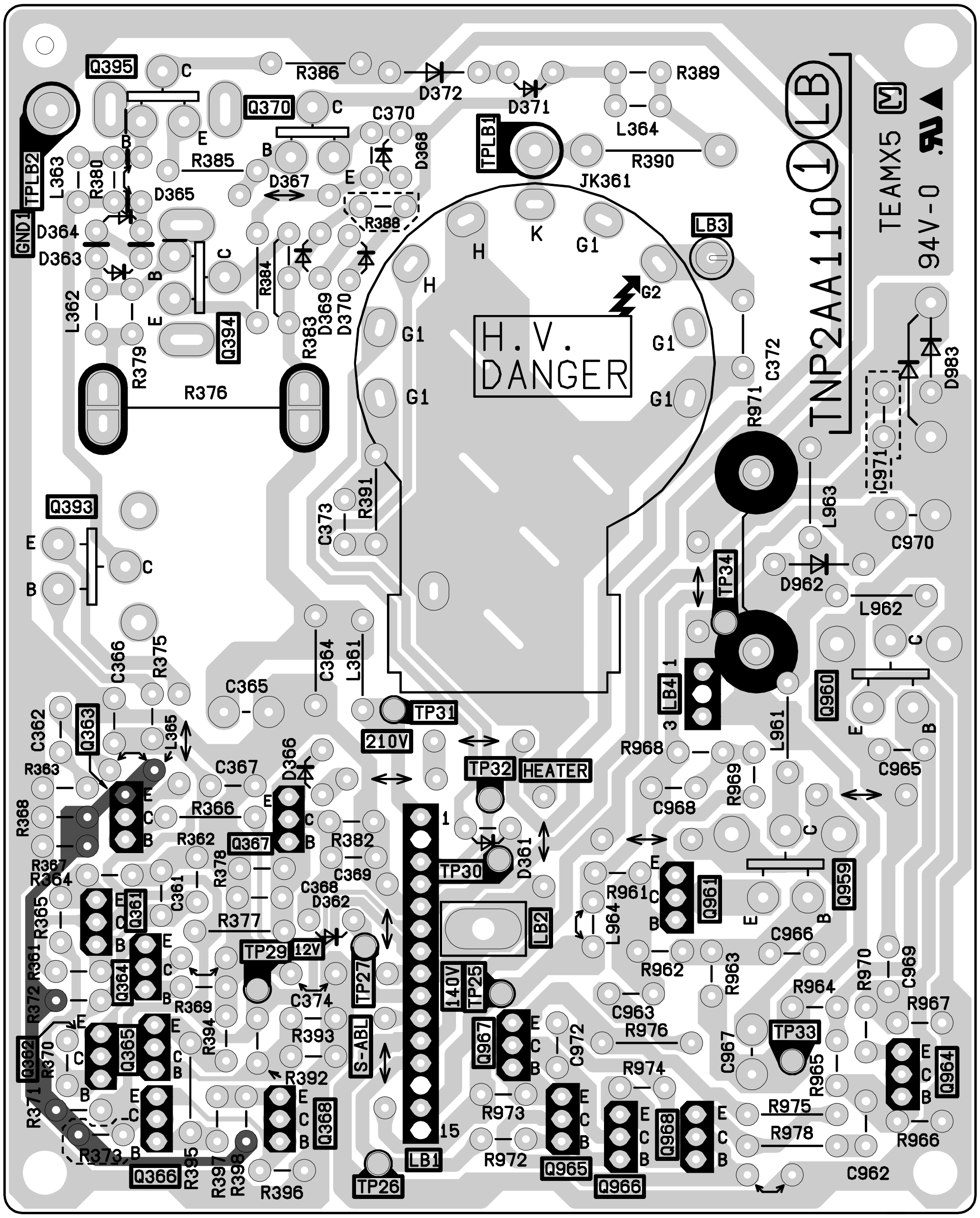
LR-Board voltages - TNP2AA111

	Q301	Q302	Q303	Q353	Q354	Q355	Q901
B	0.11	3.92	0.60	11.98	174.90	173.70	137.80
C	215.90	11.61	0.08	173.70	218.60	0.42	130.20
E	0.00	3.71	0.00	11.65	174.60	174.20	138.40

	Q903	Q904	Q905	Q906	Q907	Q957	Q958
B	9.10	0.97	9.10	9.72	8.49	129.60	9.69
C	0.00	9.12	8.90	18.91	6.00	71.30	71.30
E	9.73	0.37	8.49	9.13	9.11	130.20	9.12


FOCUS
EHT (TO FBT)
FOCUS PACK G2
VM COIL
CRT (BLUE)
H
HG
K
G1
G2
LB1
LB2
LB3
LB4
LG4
JK361
TPLB1
TPLB2
GND1 (SYGNAL)
GND2 (PACH1)
JS7
JS8
GND (VM)
GND3 (VM)
VM AMP
CENTRE 139V
CENTRE 1V
140V
130V
10V
+70V
18V
210V
220V
1KV
Q361
Q362
Q363
Q364
Q365
Q366
Q368
Q393
Q394
Q395
Q959
Q960
Q961
Q964
Q965
Q966
Q967
Q968
D361
D362
D363
D364
D365
D367
D368
D369
D370
D371
D372
D962
D983
L361
L362
L363
L364
L365
L961
L962
L963
L964
C361
C362
C364
C365
C366
C367
C372
C373
C374
C962
C963
C965
C966
C967
C968
C969
C970
C972
R361
R362
R363
R364
R365
R366
R367
R368
R369
R371
R372
R375
R376
R379
R380
R383
R384
R385
R386
R389
R390
R391
R392
R393
R394
R395
R396
R397
R398
R959
R961
R962
R963
R964
R965
R966
R967
R968
R970
R971
R972
R973
R974
R975
R976
R978
TP25
TP26
TP27
TP29
TP30
TP31
TP32
TP33
TP34
210V
NC
HEATERS. 3V
OFF_MUTE
GND (SYGNAL)
B
12V
GND (PACH1)
S-ABL
18V
GND (VM)
VM
NC
140V
TNP2AA110
LB

LB-Board layout - TNP2AA110


Q395
R386
D372
D371
R389
Q370
C370
D368
TPLB1
L364
R390
JK361
TPLB2
L363
R380
R385
D367
D365
R388
GND1
D364
D363
L362
R379
R376
Q394
R384
R383
D369
D370
H
K
G1
G2
LB3
H.V. DANGER
C372
R971
TNP2AA110
TEAMX5
94V-0
LB
D983
C971
L963
C970
Q393
E
B
C
C373
R391
TP34
D962
L962
C366
R375
C365
C364
L361
TP31
210V
LB4
Q960
C362
Q363
R363
L365
C367
D366
TP32
HEATER
R968
R969
L961
C965
R368
R366
R362
Q367
R382
C968
R367
R364
R378
C361
C369
C368
D362
TP30
D361
R961
Q961
Q959
R365
Q361
R377
LB2
L964
C966
R361
Q364
TP29
12V
TP27
140V
TP25
R962
R963
R970
C969
R372
R369
C374
R964
R967
C963
Q362
R370
Q365
R394
R393
S-ABL
Q967
C972
R976
TP33
C967
R965
Q964
R371
R392
R974
R373
Q366
Q368
R973
R975
R978
R966
R395
R397
R398
R396
TP26
LB1
R972
Q965
Q966
Q968
C962
1
3
15

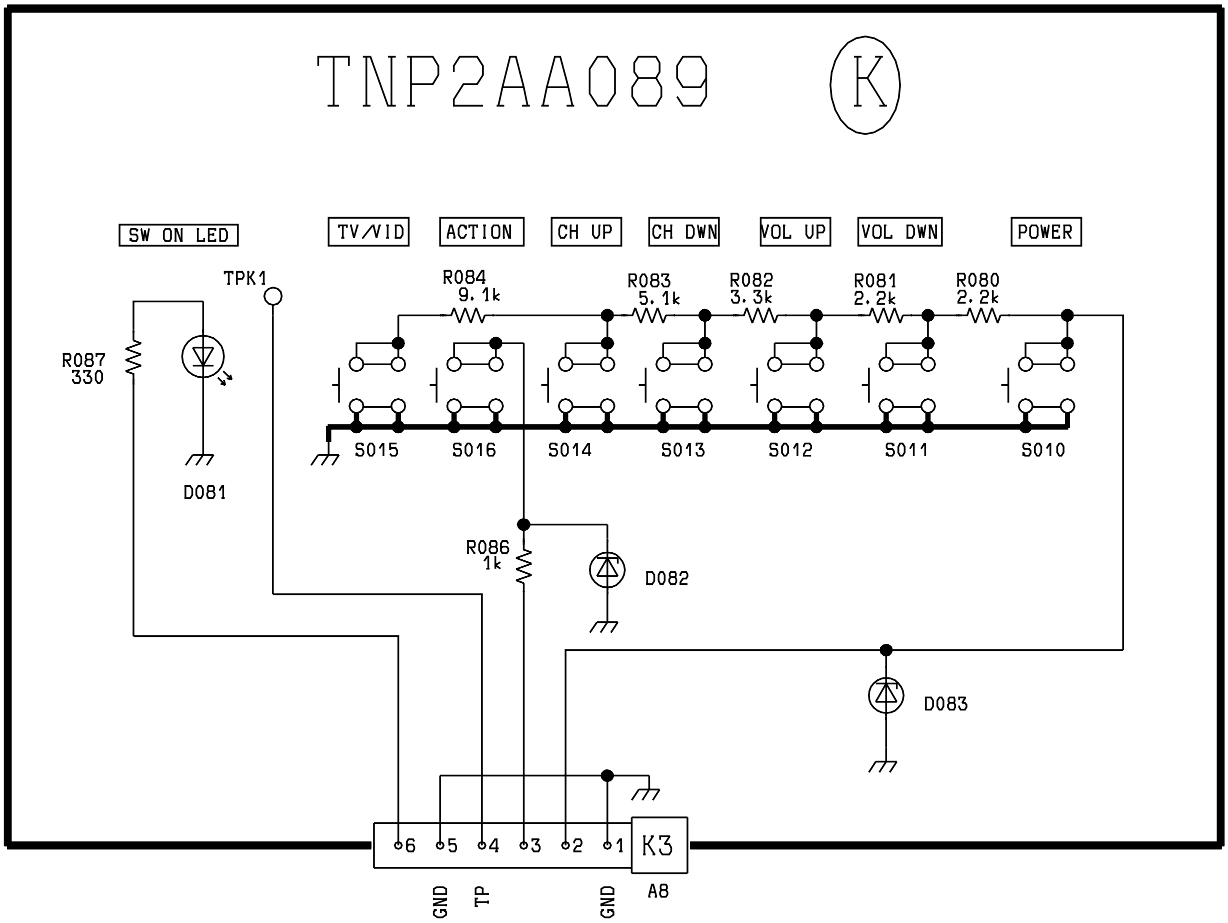
LB-Board voltages- TNP2AA110

	Q361	Q362	Q363	Q364	Q365	Q366	Q368
B	5.14	4.51	3.86	3.92	5.91	5.08	4.48
C	11.98	11.98	11.54	0.00	11.98	11.98	0.00
E	4.51	3.92	3.70	3.51	5.28	4.48	3.96

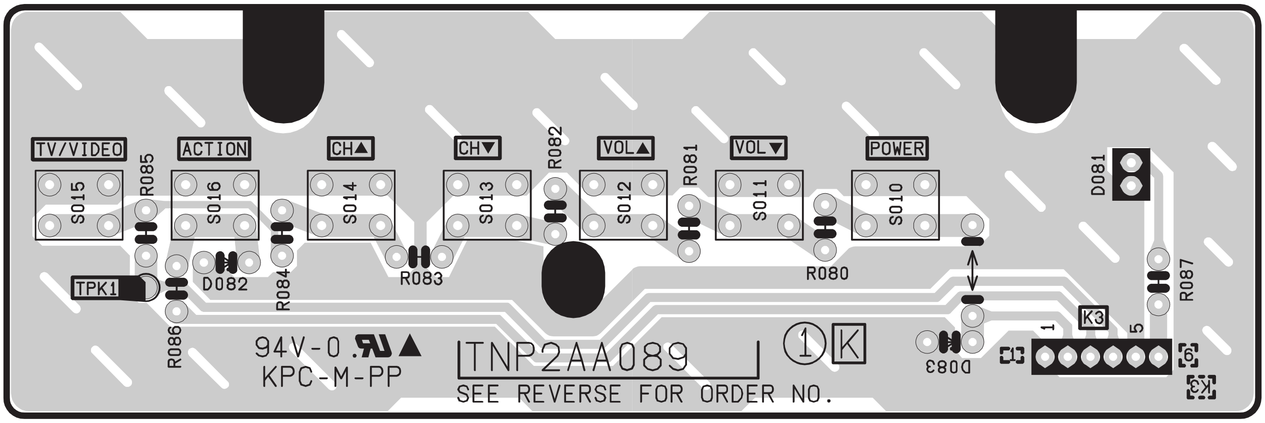
	Q393	Q394	Q395	Q959	Q960	Q961	Q964
B	11.98	172.00	170.60	129.30	9.67	137.80	0.98
C	170.60	218.60	0.42	71.40	71.50	129.90	9.10
E	11.54	171.90	171.50	129.90	9.10	138.40	0.37

	Q965	Q966	Q967	Q968
B	9.09	9.09	9.72	8.50
C	0.00	18.91	18.91	0.00
E	9.72	8.49	9.14	9.11

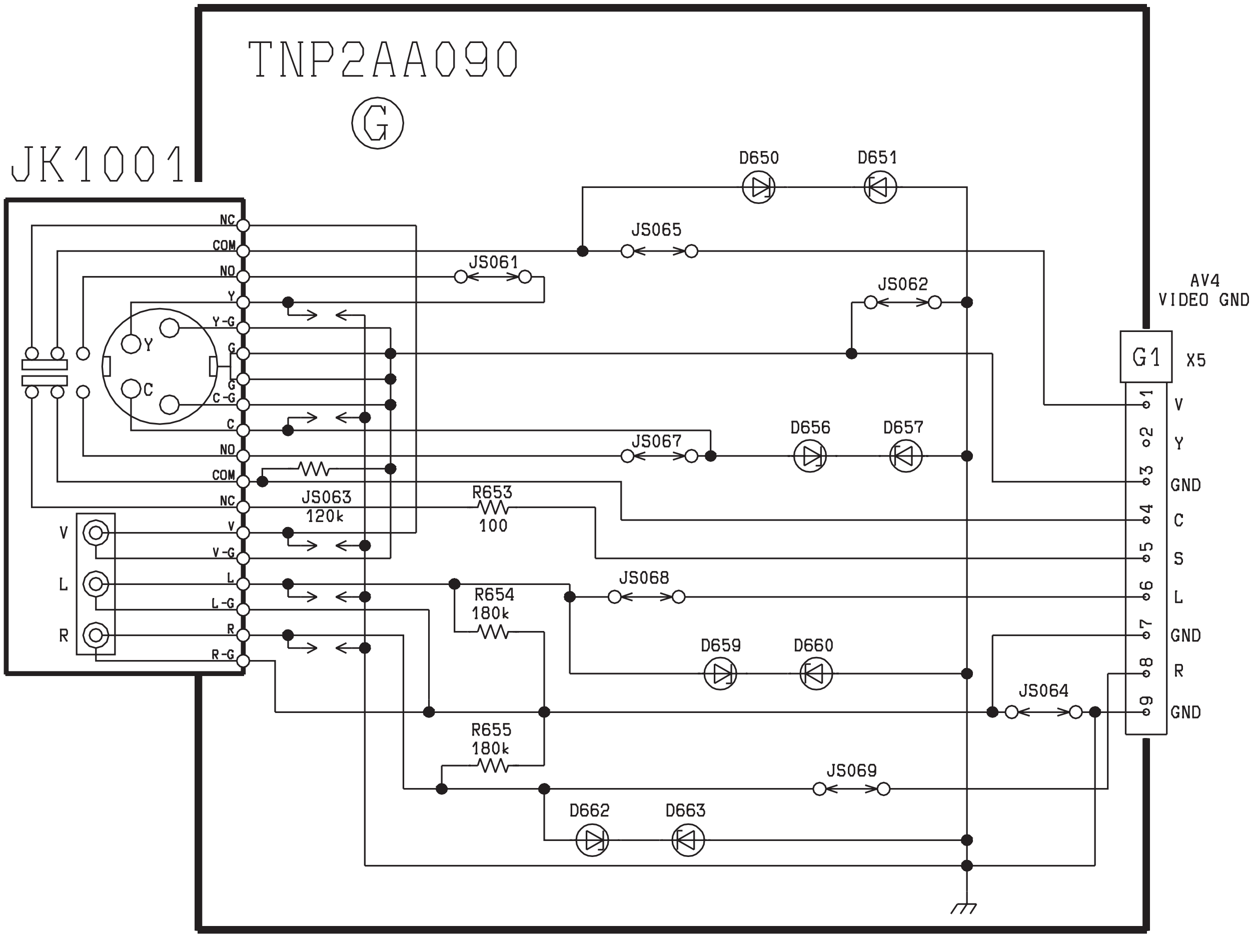
K-Board schematic - TNP2AA089


TNP2AA089
K
SW ON LED
TV/VID
ACTION
CH UP
CH DWN
VOL UP
VOL DWN
POWER
TPK1
R084 9.1k
R083 5.1k
R082 3.3k
R081 2.2k
R080 2.2k
R087 330
D081
S015
S016
S014
S013
S012
S011
S010
R086 1k
D082
D083
6
5
4
3
2
1
K3
GND
TP
GND
A8

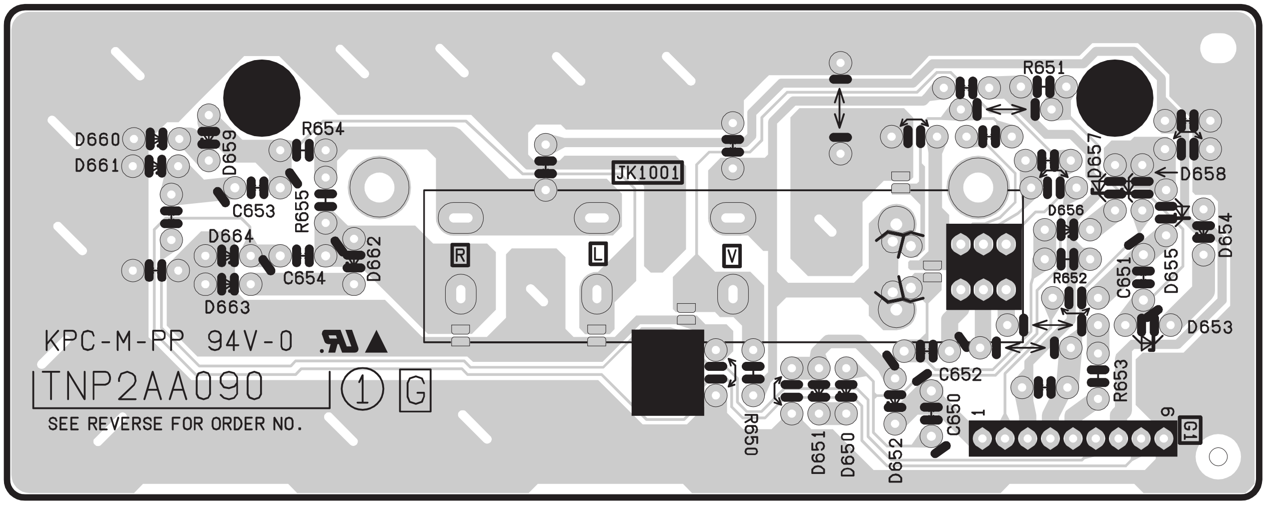
K-Board layout - TNP2AA089


TV/VIDEO
S015
R085
ACTION
S016
CH▲
S014
CH▼
S013
R082
VOL▲
S012
R081
VOL▼
S011
POWER
S010
D081
TPK1
D082
R084
R083
R080
R087
R086
94V-0
KPC-M-PP
TNP2AA089
SEE REVERSE FOR ORDER NO.
1
K
D083
1
K3
5
6

G-Board schematic - TNP2AA090


TNP2AA090
G
JK1001
NC
COM
NO
Y
Y-G
G
G
C-G
C
NO
COM
NC
V
V-G
L
L-G
R
R-G
Y
C
V
L
R
D650
D651
JS065
JS061
JS062
AV4
VIDEO GND
G1
X5
1 V
2 Y
3 GND
4 C
5 S
6 L
7 GND
8 R
9 GND
D656
D657
JS067
JS063
120k
R653
100
R654
180k
JS068
D659
D660
JS064
R655
180k
JS069
D662
D663

G-Board layout - TNP2AA090


D660
D661
D659
R654
C653
R655
D664
D662
C654
D663
KPC-M-PP 94V-0
TNP2AA090
① G
SEE REVERSE FOR ORDER NO.
JK1001
R
L
V
R650
D651
D650
D652
C650
C652
R651
D657
D658
D656
D654
D655
C651
R652
D653
R653
1
9
G1

D-Board integrated circuits voltages - TNPH0371

IC451	
1	0.04
2	16.74
3	-16.74
4	-17.85
5	0.64
6	16.35
7	0.04

IC805	
1	19.04
2	GND
3	9.06

IC811	
1	19.04
2	18.03

IC601	
1	0.24
2	0.06
3	N.C.
4	N.C.
5	GND
6	6.50
7	* 5.17
8	9.06
9	2.50
10	0.60
11	0.86
12	N.C.
13	GND
14	GND
15	3.10
16	4.43
17	4.51
18	N.C.
19	N.C.
20	N.C.
21	N.C.
22	4.87
23	N.C.
24	0.28

IC602	
1	4.28
2	0.62
3	12.01
4	6.08
5	GND
6	4.11
7	N.C.
8	0.61
9	4.47
10	4.43
11	N.C.
12	GND
13	4.86
14	3.86
15	6.02
16	3.19

IC603	
1	3.83
2	5.29
3	5.29
4	GND
5	3.25
6	3.25
7	2.96
8	9.06

IC1501	
1	0.00
2	5.29
3	4.61
4	GND
5	5.82
6	5.82
7	4.28
8	9.06

IC701	
1	5.92
2	0.60
3	1.16
4	GND
5	5.98
6	3.83
7	6.70
8	9.06

IC802	
1	139.20
2	17.93
3	GND

IC803	
1	16.01
2	12.01
3	GND

IC801 ↓	
1	0.06
2	0.06
3	0.07
4	0.06
5	GND
6	-0.14
7	0.09
8	0.70
9	0.07

D-Board transistors voltages - TNPH0371

	Q406	Q503	Q509	Q510	Q551 ↓	Q601	Q602	Q603
B	6.09	0.28	29.39	31.82	0.07	0.60	4.11	0.62
C	0.06	8.46	138.80	138.80	-4.53	2.76	9.06	6.08
E	0.00	0.00	31.83	31.32	0.21	0.00	3.53	0.00

	Q604	Q605	Q606	Q802 ↓	Q803 ↓	Q854	Q1503	Q1504
B	6.07	4.13	0.03	0.07	0.07	138.80	10.40	11.97
C	9.06	0.00	10.40	0.07	0.09	0.00	4.14	510.00
E	5.49	4.71	0.00	0.07	0.07	139.10	10.98	11.46

	Q1505	Q501	Q502	Q701	Q801 ↓
S	4.04	0.00	0.00	0.00	0.07
D	10.49	16.07	0.01	30.80	-40.20
G	3.99	3.09	8.44	6.70	0.12

Voltages marked with ↓ use HOT ground, please check schematic to confirm the type of ground used for each component

*** Set may reset when probing this pin. If TV does not turn ON, unplug from AC outlet, plug it back and turn it ON.**

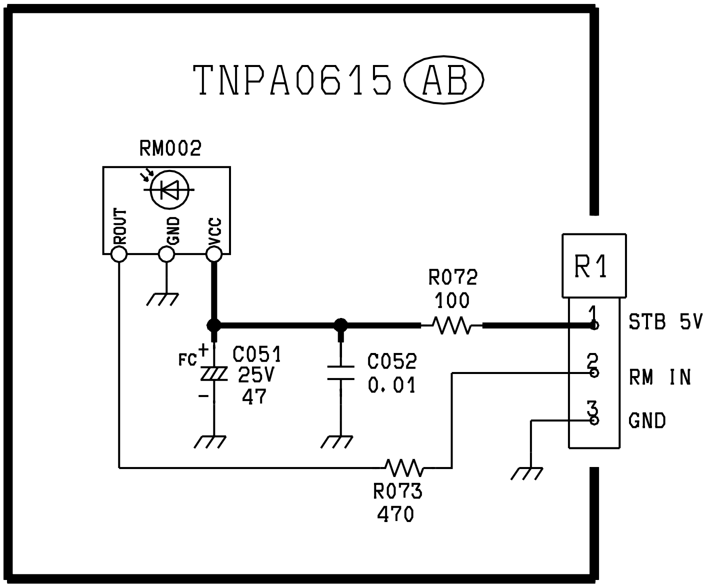
A-Board integrated circuits voltages - TNP2AH035

IC2302	
4	-23.50
5	-23.45
6	-0.35
7	20.99
8	9.36
9	4.90
10	0.00
11	2.54
12	0.05
13	0.00
14	0.00
15	5.20
16	GND
17	-22.09
18	0.00
19	-5.31
20	0.06
21	0.00
22	0.00
23	N.C.
24	9.30
25	20.99
26	-0.32
27	-23.45
28	-13.20

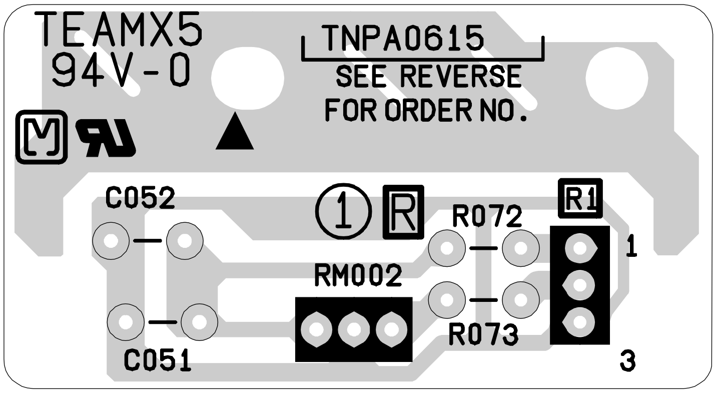
IC7002			
1	GND	10	18.84
2	GND	11	-0.47
3	-18.59	12	-19.72
4	-19.70	13	-0.36
5	18.85	14	-0.37
6	-0.11	15	-0.23
7	-0.11	16	-0.23
8	-19.71	17	-19.71
9	-0.13	18	-0.28

IC7001			
1	GND	10	18.84
2	GND	11	0.00
3	-18.60	12	-19.70
4	-19.70	13	0.00
5	18.84	14	0.00
6	-0.40	15	-0.36
7	-0.39	16	-0.35
8	-19.70	17	-19.70
9	-0.53	18	-0.48

R-Board schematic - TNPA0615AB


TNPA0615 AB
RM002
ROUT
GND
VCC
R072
100
R1
1
STB 5V
2
RM IN
3
GND
FC
+
C051
25V
47
-
C052
0.01
R073
470

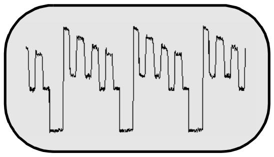
R-Board layout - TNPA0615


TEAMX5
94V-0
TNPA0615
SEE REVERSE
FOR ORDER NO.
M
C052
① R
R072
R1
1
RM002
R073
C051
3

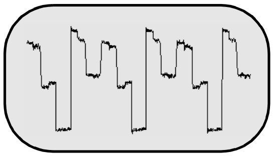
Voltages marked with ↓ use HOT ground, please check schematic to confirm the type of ground used for each component

*** Set may reset when probing this pin. If TV does not turn ON, unplug from AC outlet, plug it back and turn it ON.**

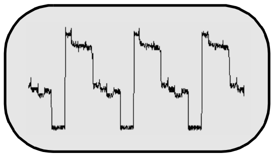
A-Board



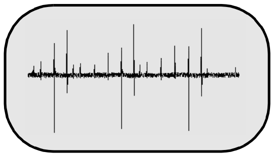
① **5.84 Vp-p**
A15 PIN 2 (BLUE OUT)



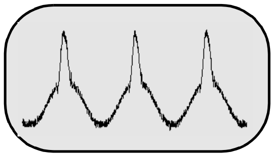
② **5.60 Vp-p**
A15 PIN 4 (RED OUT)



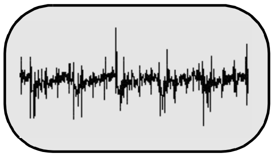
③ **6.32 Vp-p**
A15 PIN 6 (GREEN OUT)



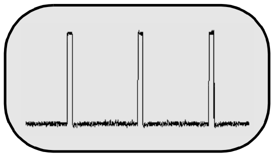
④ **2.74 Vp-p**
A15 PIN 9 (VM OUT)



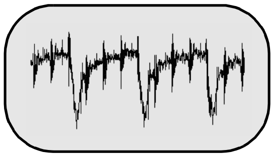
⑤ **1.70 Vp-p**
A15 PIN 11 (S-ABL)



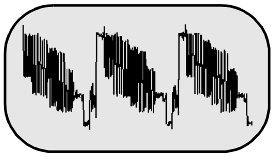
⑥ **0.14 Vp-p**
A4 PIN 16 (DFCUT)



⑦ **3.24 Vp-p**
A3 PIN 15

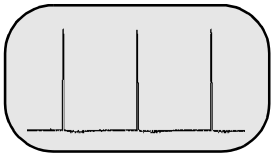


⑧ **0.17 Vp-p**
A2 PIN 13 (ABL)

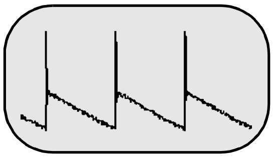


⑩ **1.00 Vp-p**
TNR001 (VIDEO)

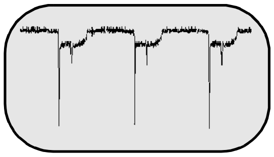
D-Board



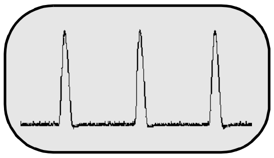
⑬ **36.0 Vp-p**
IC451 PIN 3



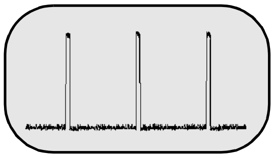
⑭ **68.8 Vp-p**
IC451 PIN 5 (V-OUT)



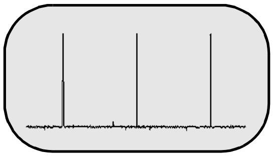
⑮ **14.0 Vp-p**
Q551-B



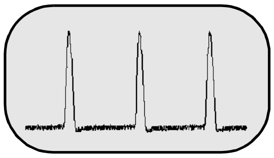
⑯ **1.50 KVp-p**
Q551-C



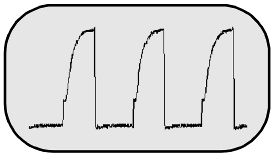
⑰ **3.12 Vp-p**
IC601 PIN 1 (H-PULSE)



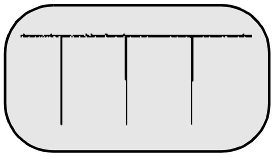
⑱ **3.20 Vp-p**
IC601 PIN 2 (VP3)



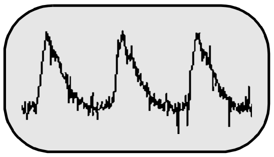
⑲ **6.48 Vp-p**
IC601 pin 10 (fbp in)



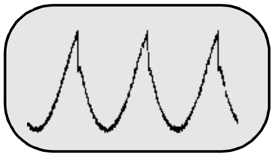
⑳ **8.40 Vp-p**
IC601 PIN 15 (H-DRIVE OUT)



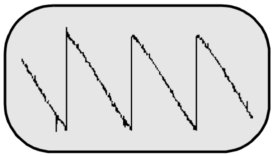
㉑ **4.96 Vp-p**
IC601 PIN 22 (V-PULSE OUT)



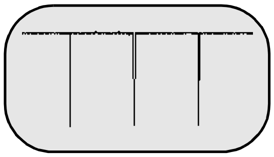
㉒ **0.53 Vp-p**
IC602 PIN 1 (EHT FB ADJ)



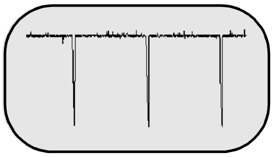
㉓ **1.70 Vp-p**
IC602 PIN 4 (EW FB)



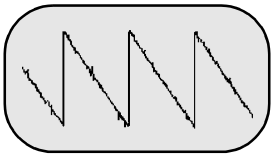
㉔ **1.90 Vp-p**
IC602 PIN 6 (V FB)



㉕ **4.80 Vp-p**
IC602 PIN 13 (V IN)

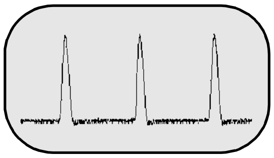


㉖ **2.84 Vp-p**
IC602 PIN 14 (TC)



㉗ **2.04 Vp-p**
IC602 PIN 15 (RAMP)

LG-Board



⑫ **27.6 Vp-p**
LG2 PIN 7 (HEATER)

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